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LAKE ONTARIO SHORE PROTECTION STUDY: LITERATURE REVIEW REPORT.(U)
JUL 79 R SWEENEY, T WOLFE, L TINGUE DACW49-79-C-0026

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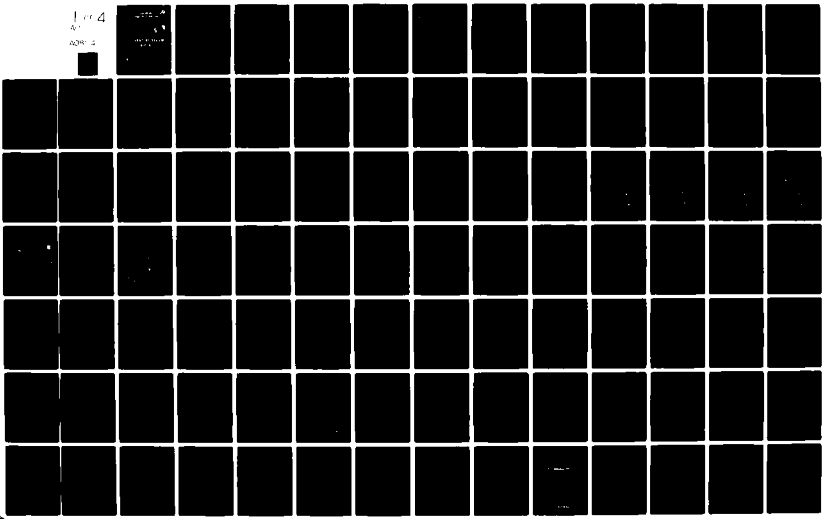

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The purpose of the report was to prepare a document that would be of aid to the Corps staff involved with Stage I of the Lake Ontario Shoreline Protection Study (LOSPS). Information, in the form of articles, unpublished reports, books, and other printed material, was gathered and analyzed. In addition, individuals with governmental agencies, private industry, and citizens groups were contacted and interviewed. From these sources the following summary of the biological and socio-historical components in the

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nearshore, shoreline, and wetland areas of Lake Ontario from the Niagara River to Cape Vincent, and of St. Lawrence River from Cape Vincent to Massena was compiled. Special emphasis was placed on unique or rare areas and organisms (including endangered species). An attempt was made to identify anticipated anthropogenic alterations in these regions.

LAKE ONTARTO SHORE PROTECTION STUDY

LITERATURE REVIEW REPORT

JULY 1979

U. S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

ACKNOWLEDGMENTS

This report was prepared under contract with the Great Lakes Laboratory (Contract DACW49-79-C-0026) for the purpose of providing an initial literature identification and review, which pertains to Lake Ontario and its nearshore shoreline and coastal zone within the United States territory. The Buffalo District would like to recognize Dr. Robert Sweeney, Theresa Wolfe, and Lynette Tingue of the Great Lakes Laboratory for their efforts in preparing this report.

This report is comprised of three sections. The first section is the Literature Review Report which contains a summary of the biological and socio-historical components reviewed and identified for this project. The second section is the Literature Key Word Cross-Index. This section provides a cross-reference of the bibliography of pertinent literature by key words and geographic areas. The third section is the computer generated bibliography of the pertinent literature, which contains the author, date, and title publication key words, geographic codes, and brief abstract of the literature.

PREFACE

The purpose of the project was to prepare a document that would be of aid to the Corps staff involved with Stage I of the Lake Ontario Shoreline Protection Study (LOSPS). Information, in the form of articles, unpublished reports, books and other printed material, was gathered and analyzed. In addition, individuals with governmental agencies, private industry, and citizen groups were contacted and interviewed. (A list of agencies contacted is included in the Appendix.) From these sources the following summary of the biological and socio-historical components (including recreation) in the nearshore, shoreline, and wetland areas of Lake Ontario from the Niagara River to Cape Vincent, and of St. Lawrence River from Cape Vincent to Massena was compiled (Section One). Special emphasis was placed on unique or rare areas and organisms (including endangered species). An attempt also was made to identify anticipated anthropogenic alterations in these regions.

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HISTORICAL SURVEY

I. INTRODUCTION

Lake Ontario's location on a major water route to the heartland of the continent has assured it a prominent position in the history of North America.

Early Indian inhabitants of New York's shoreline reached the Lake Ontario basin from Alaska about 8,000 years ago. Later migrations brought other tribes into the region, each destroying the remnants of its predecessors and establishing its own culture. The last Indian tribe to hold the area was the Iroquois League, who located their villages along the high ridge 10 to 20 miles from the shoreline, near good canoe routes. French explorers entered the lake in 1615 beginning a power struggle that was to last for 200 years. Control of the lakes passed from the Iroquois to the French, the British, and finally, to the United States in 1815. Lake Ontario was the scene of military operations in the French and Indian War, Revolutionary War, and the War of 1812.

II. SURVEY OF HISTORIC SITES

A. Old Fort Niagara was built by the French in 1727 at the mouth of the Niagara River.[3] It is one of the best preserved and restored forts in America. Owned by the state of New York, it is administered by the Old Fort Niagara Association.[1]

B. The Town of Sommerset, located in the north-eastern part of Niagara County, was an Indian hunting ground, and later a camp site for French traveling to Fort Niagara. A number of shipwrecks have been reported near the mouth of Golden Hill Creek, one of which carried LaSalle's equipment to build the Griffon. Fish Creek was the site of Indian encampments for annual hunting and fishing trips. A salt spring existed a short distance upstream, where salt was manufactured before the coming of the white man.[6]

C. Monroe County was the center of a long period of Indian activity. A historical marker on the shore in the town of Greece marks the site of an Iroquois hunting camp excavated in 1912. Another marker commemorates the Indian trail along the ridge, which later became the route followed by pioneer settlers. The town of Parma is the site of Indian campsites, but this entire area was too swampy for permanent villages. The first white visitors to this region included LaSalle in 1669, and Galinee,who mapped the Braddock Bay in 1670.[4]

Later, French visitors to Niagara Falls camped along the shore. A historical marker in Irondequoit shows the sites of Fort DesSables, built by Joncaire in 1717. Marquis Denonville's army stopped near Devil's Nose in the town of Hamlin on their expedition against the Seneca Indians in the French and Indian War.

The first white settlements tended to favor sites south of the lakeshore region, which at that time was swampy and

thickly populated by rattlesnakes, bears, and wolves. The proposed city of Tryon on Irondequoit Bay was abandoned and became a ghost town by 1818. The area around the mouth of the Genesee River was originally incorporated as the village of Charlotte. It became part of the city of Rochester in 1915. The area was the site of several skirmishes in the War of 1812, as were the towns of Parma and Webster. Nine Mile Point in Webster was the site of the area's first saw and grist mill built on Four Mile Creek by Caleb Lyon in 1805. The area was first occupied by Abram Foster, who built a log cabin there in 1790. John Whiting built a cabin and sawmill on Mill Creek. The house he built in 1835 still stands as the White House Lodge in Webster Park.

The lakefront was developed first as farmland and gradually evolved into a summer resort area. Development of this area was escalated with the extension of the trolley and railroad lines around the end of the 19th century.

Manitou Beach Park, at Hick's Point in the town of Greece, was a thriving resort which has declined since 1920. Island Cottage, Crescent and Grand View Beaches sprang up after the Grand View and Manitou Railroad began operation in 1891. A state historic marker has been placed to commemorate the trolley line.

Troutburg was a popular fishing area and the site of the popular Story House hotel and the temperance hotel, The Cady House.

Hamlin Beach was a county park area since 1928, and a

state park since 1937. The Civilian Conservation Corps Camp was occupied from 1934 to 1940. The facilities were used by as many as 151 German prisoners of war from 1944 to 1946.

Sandy Harbor Beach was the location chosen by Francois Fourier in 1843 for a socialistic community. The settlement survived only a short time and gradually became a resort area. During the prohibition years, this area became notorious for its bootlegging activities.

Lighthouse Beach in the Town of Parma is the site of Braddock Point Lighthouse built in 1896. In 1957 it was converted to a residence and replaced by a modern U.S. Coast Guard tower. Artist Aylesworth B. Haines' Octagon House was completed in 1937 and still serves his family as a private residence. A group of Canadian counterfeiters used a cave at Bogus Point as a distribution point for their currency near the beginning of the 20th century. William Reis' handmade merry-go-round horses were a prominent feature at Wautoma Beach, Parma's "Coney Island."

The Charlotte area of the city of Rochester became notorious as the stage for famous performers including Blondin in 1885, the "Boy Daredevil of the Sky," in 1891, Barber and his bicycle in 1904, and Frisbie's biplane flight into the lake in 1910.

President Benjamin Harrison breakfasted at the Cottage Hotel in 1892. Windsor Beach Pavillion was the first summer resort structure in western New York. Built in 1882, it was called "The House of Glass." The Rochester Baseball Club International League played its Sunday baseball games here because

Sunday baseball games were prohibited in the city. Sea Breeze was the home of the "Circle Swing," the first amusement device of its kind in western New York.

The town of Webster was home to the Forest Lawn Club for wealthy families in the area. Glen Edith, originally called Drake's Landing, was a hotel and boat landing on Irondequoit Bay.

Although the shoreline area in Monroe County did not witness a great deal of industrial activity, some aspects are worthy of mention. George Eastman chose a site in the town of Greece in the 1890's for his Kodak plant. The part of Charlotte at the mouth of the Genesee River was a key port for lake schooners in the late 19th century. Arthur G. Yates built his coal trestle for loading barges by gravity. The port became the center of shipment of Pennsylvania coal to Canadian cities. Joseph Vinton's winery in 1830 was the beginning of the vineyard and winemaking industry which thrived on the shores of Irondequoit Bay. Truck formers grew a variety of crops including the famous Irondequoit melon. Agriculture in Webster grew from truck farming to fruit harvesting and soon made the town the center of the cattle and dairy industry.

D. The most important port on the United States shore of Lake Ontario is the city of Oswego, located at the mouth of the Oswego River. It was the site of Fort Oswego, built by the British in 1727 and later destroyed by the French. The site now is designated by a historical marker. Fort Ontario, established

on Lake Ontario at the mouth of the Oswego River across from Fort Oswego in 1755, figured prominently in the struggle for control of the lakes. The fort was burned and subsequently rebuilt and burned again. The present fort was built in 1839 and remodeled between 1863 and 1872. It is now a state-owned historic site and museum.[10] There are no archaeological excavations near Oswego.[11] The shoreline near Oswego has been developed as a power corridor with the establishment of a number of electric and nuclear power generating plants.

E. The region from Jefferson County eastward figured prominently in the War of 1812, and since then has become a prime recreational area. Historic sites abound in this area. In the Town of Henderson is located the Stony Point Light, a lighthouse on Stony Point, west of Henderson Harbor. It is now a private residence. The William Johnson House was probably built by William Johnson in 1810. It was used as a station in the Underground Railroad and is still owned by the Johnson Family. Fort L'Observation at Sixtown Point was built in 1756 by French soldiers. The Village of Sackets Harbor is the site of a War of 1812 battlefield and cemetery which is maintained as a State Historic Site and museum.[2]

In the Town of Brownville is the Samuel Read House, on the lake shore of Pillar Point at Sherwins Bay. It was built of native limestone about 1827. The James R. Adams House nearby is also built of native limestone.

The Town of Lyme is the site of three native limestone

houses built on Point Salubrious between 1818-1820. They are the Ryder House, the Johnson House, and the James Horton House.

Wilson's Bay, in the Town of Cape Vincent, is the site of four unique houses built of native limestone: Bayworth Farm, the Austin Rogers House, the Plastered Stone House, and the Charles Wilson House. The Tibbets Point Lighthouse located where Lake Ontario meets the St. Lawrence River, is still in use.

The Town of Clayton is the site of the Calumet Island Water Tower, all that remains of a mansion formerly located on the Island.

The Ainsworth Octagon House, called "Waving Branches," was built in the Town of Orleans in 1876. Its unique octagonal shape is architecturally significant.

The Town of Alexandria is the site of a significant number of historic sites located near the coastal zone. The Campbell House and Century House stand on the bank of the River.

Sunken Rock Lighthouse is located on small Sunken Rock Island in the Village of Alexandria Bay. Bonnie Castle, built in 1877 by author Dr. Josiah G. Holland, served as a seminary for the White Fathers of Africa. It is now part of the Bonnie Castle Marina.

Dark Island Castle in the Town of Hammond is the only surviving Rhine-style castle left in the Thousand Islands. Crossover Lighthouse is an inactive lighthouse built in the 1840's. It is located on an island at the point where ships cross over to the American Channel of the St. Lawrence River.

Morristown is the site of the Coppernall Home, a restored colonial home. The Augustus Chapman House is reputed to be the first split-level stone house in the area. It was built in 1825. "Pine Eden" is the site of the home of Barton Crookshank, the inventor of the "Talon" zipper. The Ogdensburg Custom House was constructed in 1809-10 as a storehouse for David Parish. It has been headquarters for Customs District 7 since 1938.[9]

The Town of Lisbon contains a home and gristmill dating from the first settlement in the area.[2]

III. SUMMARY

Published historical information for the Lake Ontario Shoreline is most complete for the areas of Monroe, Jefferson, and St. Lawrence County, and Forts Niagara and Ontario.

A wealth of unpublished archival material exists in the files of the agencies involved in historic preservation in the Lake Ontario Coastal Zone.[5]

ALBANY:

New York State Division for Historic Preservation
Agency Building 1
Empire State Plaza
Albany, New York 12238

Office of State History
New York State Education Department
Washington Avenue
Albany, New York 12224

BUFFALO:

Landmark Society of the Niagara Frontier
c/o Appleton Fryer, President
25 Nottingham Court
Buffalo, New York 14216

COOPERSTOWN:	New York State Historic Trust c/o Louis C. Jones New York State Historical Association Cooperstown, New York 13326
OSWEGO:	Heritage Foundation of Oswego P.O. Box 405 Oswego, New York 13126
ROCHESTER:	The Landmark Society of Western New York, Inc. c/o Mrs. Patrick Harrington, Executive Director 130 Spring Street Rochester, New York 14608

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RECREATION

The New York shoreline of Lake Ontario is 170 miles long, with another 108 miles of New York shoreline on the St. Lawrence River.[9] These bodies of water offer New York residents a wealth of varied recreational opportunities: boating, water skiing, fishing, bird hunting, camping, sunbathing, swimming, hiking, picnicking, bicycling, horseback riding, golf, and some winter sports. A variety of geological formations are observable. There are many bays, inlets, marshes, bluffs, beaches, and dune formations. Sand beaches are narrow and infrequent west of Oswego. From Oswego east to Henderson Harbor, however, there are good sand beaches. East of Henderson Harbor, the shoreline is low and rocky. The Eastern shoreline boasts some unique geological formations:

Clayton Rock Ledges - vertical bluffs on the shoreline between Clayton and Cape Vincent.

Stony Point Cliffs - limestone bluffs from the Stony Point Lighthouse to Stony Point.

Sodus Bay - erosion of drumlins has created moon-like topography.

Chimney Bluffs - Sodus Bay

Lack of natural shelter for most of the New York shoreline has limited the widespread use of the lake for boating. The Thousand Islands at the beginning of the St. Lawrence River draws vacationers from all over the nation. Because of these attractions, there has been a growth of marinas, trailer and camping grounds, cottages, resorts, restaurants, and inns. In 1976, the St. Lawrence - Eastern Ontario Commission estimated that 97% of the seasonal residences in this area were water-side residences.[10] Of the visitors to this area, it was estimated that nearly all were boaters and 93% were fishermen.[10] In 1960, the IJC estimated that there were 37,500 vacation homes along the Lake Ontario shoreline.[7] There are few hunting areas along the shore. These include: Braddock Bay west of Rochester, and Canoe Picnic Point State Park near the Town of Clayton. Sport

fishing is also a great recreational attraction, although the Oswego area is noted as poor in sport fish. The following tables provide an inventory of recreational areas, both public and private, on the Lake Ontario and St. Lawrence River U.S. shoreline. Also included in this section are maps pin-pointing some of these areas.

NIAGARA COUNTY

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
Porter	Fort Niagara	P	284	X		X					X	X
	Fourmile Creek State Park	P	248			X	X				X	
	Six Mile Creek	P				X						
Wilson Harbor	Wilson-Tuscarora State Park, Wilson, N.Y.	P	260		X						X	
	Beccue Island Boat Basin	pr			X							
	Clark Island Marina	pr			X							
	Yacht Haven	pr			X							
	Wilson Yacht Club	pr			X							
	Island Yacht Club	pr			X							
	Tuscarora Yacht Club	pr			X							
	Krull Park (County) Newfane, N.Y.	P	77	X	X	X	X	X			X	
Sommer-set	Potter Road Park	P	100			X						
	Golden Hill State Park	P	900	X	X	X	X	X			X	
	Lower Niagara State Park	P	260			X						
Olcott Harbor	Hadley Boat Company	pr			X							
	McDonough Marina	pr			X							
	Olcott Harbor, Inc.	pr			X							
	William Kohler Dock Spaces	pr			X							

P = Public; pr = Private

* = Information Unavailable

	Public/Private	Acres	Beaches/Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
ORLEANS COUNTY											
Lakeside Beach State Park	P	650	X	X	X	X				X	
Oak Orchard Harbor											
Norm's Marina	pr			X							
Harbor Breeze Marina	pr			X							
Oak Orchard Yacht Club	pr			X							
Oak Orchard Marina	pr			X							
Hatch Boat Livery	pr			X							
Elam and Harry's Boat Livery	pr			X							
MONROE COUNTY											
Hamlin Beach State Park	P	1100	X		X	X		X		X	X
Lake Ontario State Parkway	P	2020								X	
Ontario Beach	P	35	X		X						
Durand Eastman County Park	P	712	X		X						
Webster Beach County Park	P	547	X		X					X	
B. Forman County Park	P	24			X					X	
Marinas											
Manitou Marina*	pr			X							
Larry's Marina	pr			X						X	
Long Pond Sport Shop	pr			X							
Pultneyville Harbor	pr										

MONROE COUNTY
(continued)

	Public/ Private	*Acres*	*Beaches/ Swimming*	*Boating Ramps*	*Picnic*	*Camping*	*Cabins*	*Hiking*	*Hunting*	*Fishing*	*Winter Sports*
Genesee River											
Anchor Marina (West side of Genesee)*	pr										
The Yacht Center (East side of Genesee)*	pr										
Skinners Marina	pr			X							
Irondequoit Bay	pr			X							
Mayers' Marina	pr			X							
Mohawk Yacht Club	pr			X							
Newport Yacht Club	pr			X							
Oklahoma Beach			X								
Sandy Harbor Beach			X	X							
Rochester Canoe Club	pr			X							
Jim's Marina	pr			X							
Slim's Marina	pr	(closed)		X							
Empire Boat Sales	pr										
Glenn Haven Marina	pr			X							
Bluff Beach*			X								
Hilton Beach*			X								
Payne Beach*			X								
Wantoma Beach*			X								
Lighthouse Beach*			X								
Crescent Beach*			X								
Town of Greece											
Cranberry Pond	pr	200		X						X	
Long Pond	pr	500		X						X	

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
MONROE COUNTY (continued)												
Braddock Bay	Burger Marina	pr			X							
Braddock Bay	Braddock Bay State Park	P	2100		X	X				X	X	X
WAYNE COUNTY												
	Forman Park*											
	Lake Shore Game Management Area*											
Great Sodus Bay Harbor	Sills Marina	pr			X							
Great Sodus Bay Harbor	Arney's Marina	pr			X							
Great Sodus Bay Harbor	Krenzer Marina	pr			X							
Great Sodus Bay Harbor	Sodus Bay Yacht Club	pr			X							
Great Sodus Bay Harbor	Sodus Bay Sports	pr			X							
Great Sodus Bay Harbor	Bill Kallusch Boats	pr			X							
Great Sodus Bay Harbor	Anchor Marina	pr			X							
Great Sodus Bay Harbor	Karwech's Marina	pr			X							
Great Sodus Bay Harbor	Trestle Marina	pr			X							
Great Sodus Bay Harbor	Connelly's Cove	pr			X							
Great Sodus Bay Harbor	Tucker Marina	pr			X							
Great Sodus Bay Harbor	Sanford Bait Shop	pr			X						X	
Great Sodus Bay Harbor	Oak Park Marina	pr			X							
Port Bay Harbor	The Anchorage	pr			X							
Port Bay Harbor	Pier 1	pr			X							
Port Bay Harbor	Launch Area	P			X							

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
	WAYNE COUNTY (continued)											
Pultneyville Harbor	Pultneyville Yacht Club	pr			X							
	Pultneyville Marine Company	pr			X							
	Pultneyville Mariners, Inc.	pr			X							
	CAYUGA COUNTY											
	Fairhaven Beach State Park	P	862	X	X	X	X	X			X	
Little Sodus Bay	Fairhaven Yacht Club	pr			X							
	Rasrecks Marina	pr			X							
	Fairhaven Marine Service	pr			X							
	Busters Boat Basin	pr			X							
	OSWEGO COUNTY											
	Mexico Point Boat Launch Site	P	10		X						X	
	Selkirk Shores State Park	P	980	X		X	X	X			X	X
Port Ontario	Lighthouse Marina	pr			X							

Local facilities: launching ramps, boat rentals, and berthing for 50 boats. Parking areas limited, especially during salmon season. Fishing, boating, picnicking, and camping predominant recreational activities in the area.

Area	Site	Public/Private	Acres	Beaches/Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
OSWEGO COUNTY (continued)												
	Fort Ontario Park	P	27	X	X	X						
	North Sandy Pond	P/pr		X	X		X	X	X	X	X	X
JEFFERSON COUNTY												
	Allen's Boat Livery Hounsfield, N.Y.	pr	5		X		X					
Sacketts Harbor	Sacketts Harbor Battlefield	P	25			X						
Sacketts Harbor	Bronson's Marina	pr	1		X	X						
Sacketts Harbor	Navy Point Marina	pr	2	X	X	X						
Sacketts Harbor	Soper's Marina	pr	2		X							
Sacketts Harbor	Local Park	P										
Brown-ville	Perch River Livery	pr									X	
Brown-ville	Stumble Inn	pr			X		X					
Chaumont Bay	Castle Harbor Boats North	pr			X	X						
Chaumont Bay	Castle Marina	pr			X							
Chaumont Bay	Crescent Marina	pr	1		X							
Chaumont Bay	Crescent Yacht Club (Inland 9 mi.)	pr			X							
Chaumont Bay	Hamilton Marina	pr	5		X							
Chaumont Bay	Village of Chaumont Park	P	1			X						

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
JEFFERSON COUNTY (continued)												
Lyme	Chaumont Bay Boat Launching Site	P	13		X							
	Bourcy's Marina	pr			X							
	Shangrila Marina	pr			X							
	Del's Marina	pr			X		X					
	Bachy's Marina	pr	1		X							
	Norm's Boat Rental	pr	2		X							
	Long Point State Park	P	23	190'	X							
	Isthmus Marina	pr	1	1800'	X		X					
	Brimmer's Marina	pr	60		X	X		X				X
Town of Cape Vincent	Humpries Boat Livery	pr	16		X		X					
	Martin's Marina and Motel	pr	6		X		X				X	
	Wilson's Bay Town Park	P	1	X		X						
	Glen Docteur	pr	6	150'			X					
	Howard Radley Cottages	pr	2		X		X	X				
	Willow Shores	pr	10	150'		X	X				X	
	Burnham Point State Park	p	12	180'	X	X	X			X	X	
	Warren's	pr	5	150'		X	X					
	Millen Bay Marina	pr			X							
	Snug Harbor Marina	pr			X							
	Scott Marina	pr			X							
	Ponds Marina	pr			X							

JEFFERSON COUNTY
(continued)

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
Village of Cape Vincent	Village Beach	P	1	X								
	Cape Vincent Boat Works	pr	1		X							
	Finucane's Marina	pr	1		X							
	Aburey's Boating Centre	pr	2		X							
	Anchor Marina	pr	2		X							
	Cape Vincent Village Park	P	1	600'	X	X						
	Sportsman Marina	pr			X							
	Garlock Cape Marina	pr			X							
Town of Orleans	Minna Anthony Common Nature Center	P		600						X	X	X
	Wellesley Island State Park	P	2635	450'	X	X	X	X	X	X	X	X
	Thousand Island State Park	P	179	180'	X		X				X	
	Waterson Point State Park	P	13	180'	X	X	X	X	X	X	X	X
	Collins Landing	P	8		X							
	Public Boat Ramp	P	1		X							
	H. Chalk & Son	pr			X	X	X					
	Grass Point State Park	P	66	350'	X	X	X					X
	Jolly Oaks Campsites	pr	35	X	X		X					
	Lakeview Wild Beach Ellisburg, N.Y.	P		X								
	Jefferson Park Camp Ellisburg, N.Y.	pr		X								

JEFFERSON COUNTY
(continued)

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
Town of Clayton	Clayton Marina	pr	5		X							
	Calumet Island Marina	pr	2		X	X						
	Washington Island Marina	pr	2		X	X						
	Canoe Picnic Point State Park	P	70	200'	X	X	X	X	X	X	X	
	Cantwell Pier	PR	65		X							
	Hobson's Spicer Marine Basin	pr	2		X							
	Millin's Bay Marina & Cottages	pr	1	X	X			X				
	Cedar Point State Park	P	48	320'	X	X	X		X	X		
	French Creek Marina	pr			X							
	Spicer Bay Marina	pr			X							
	Pier 65	pr			X							
Village of Clayton	Rice's Bait Store and Marina	pr		100'				X				
	Clayton Village Dock	pr	1		X							
	Elling's Riverside Cottages	pr	3		X			X				
	Denny's Cottages	pr	2	100'				X				
	Shipyard Marina	pr	30		X							
	1000 Island's Marina	pr	1		X							
	Clayton Municipal Dock and Launching Ramp	pr	1		X							
	Mercier's Marina	pr			X							

JEFFERSON COUNTY
(continued)

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
	Boat Launching Site	P	3		X							
	Eastman Marina	pr	5		X							
	Harbor's End, Inc.	pr	6		X							
	Cornell's Marina	pr	1		X							
	Ruddy's Fishing Ramp	pr	1		X							
	Harbor Marina	pr	1		X							
Henderson Harbor	McCarthy's Harbor, Inc.	pr	1		X							
Henderson Harbor	Northern Yachts, Inc.	pr	1		X							
Henderson Harbor	Henchen's Marina	pr	1		X							
Henderson Harbor	Henderson's Harbor Public Dock	P	1		X							
Henderson Harbor	Henderson's Harbor Yacht Club	pr	2		X							
	Champion Home Communities Recreational Vehicle Park	pr	400'				X					
	The Willows	pr	12	180'								
	Wescott Beach State Park	P	319	X								
	DeWolf Point State Park	P	13		X	X	X				X	
Town of Alexandria Bay	Barton's Cottages and Trailer Park	pr	3		X		X					
Town of Alexandria Bay	C & S Camps	pr	1		X		X					
Town of Alexandria Bay	Keewaydin State Park	P	180		X		X		X		X	
Town of Alexandria Bay	Mary Island State Park	P	13	180'	X	X	X				X	

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
JEFFERSON COUNTY (continued)												
Town of Alexandria Bay (continued)	Lanterman's Cottages	pr	2			X	X					
	Public Dock and Launching Ramp	pr	1		X							
	Kring Point State Park	P	41	500'	X	X	X			X	X	
	Wildwood Cottages	pr	3				X	X				
	Bonnie Castle Marina	pr	30		X							
	Rogers Marina	pr			X							
	Hutchinson Boat Works and Marina	pr			X							
	Hutchinson's (Bethune St.)	pr			X							
	Van's Marina	pr			X							
	Charlies Marina	pr			X							
	Mance Marina	pr			X							
Village of Alexandria Bay	5 Village Ramps and Docks	P			X							
	8 Marinas	pr		X	X	X						
	Schermerhorn's	pr	11	30'	X							
ST. LAWRENCE COUNTY												
Town of Hammond	Dark Island Retreat	pr					X				X	
	Cedar Island State Park	P	10	X	X	X	X			X	X	
	3 Hammond Town Docks	P			X							
	Donners	pr			X							

ST. LAWRENCE COUNTY
(continued)

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
Town of Morristown	Jacques Cartier State Park	P	461	800	X	X	X	X	X	X	X	X
	Bogardus Camps	pr						X			X	
Village of Morristown	Morristown Marina	pr			X							
	Wrights Sporting Goods & Marina	pr			X							
	Bay View Marina	pr			X							
	Morristown Village Dock	P			X							
Oswegatchie	Oswegatchie Town Ramp	P			X							
	Blair's Marina	pr			X							
	Ogdensburg	pr		X								
Ogdinsburg	Morrisette Park	pr			X							
	Cubby's Marina	pr			X							
	Wards Marina	pr			X							
Lisbon	Galop Island State Park	P	675					X			X	
	Lisbon Recreation Area	P	50	250'	X			X			X	

ST. LAWRENCE COUNTY
(continued)

		Public/ Private	Acres	Beaches/ Swimming	Boating Ramps	Picnic	Camping	Cabins	Hiking	Hunting	Fishing	Winter Sports
Waddington Town	Waddington Town Beach	P		X		X						
	St. Lawrence Seaway Marina	pr			X							
	Brandy Brook Boat Launch	P			X							
	Coles Creek State Park	P	1800	500'	X	X	X				X	
Waddington Village	Waddington Village Scenic Park	P										
	Village of Waddington Town Boat Launch	P			X							
Louisville	Wilson Hill Boat Launching Site	P	8		X							
	Lake St. Lawrence Yacht Club	pr	1		X							
	Town of Louisville Park	P				X						
	Coil Island State Park	P	796						X			
Masena	Massena Marina	pr			X							
	Robert Moses State Park	P	2267	1000'	X	X	X		X	X	X	
	New York State Game Management Area	P			X	X			X			
	Fish Creek Wetlands	P	506						X	X		

LAKE ONTARIO — SHORELAND USE AND OWNERSHIP 1970

(in miles)

Shoreland Use	Lake
Residential	127.0
Recreational	30.2
Wildlife	0
Forest	0
Other	132.4

Shoreland Ownership	Lake
Federal	0
Non-Federal public	31.9
Private	257.7

To Convert From	To	Multiply By
Miles (mi)	Kilometers (km)	1.609

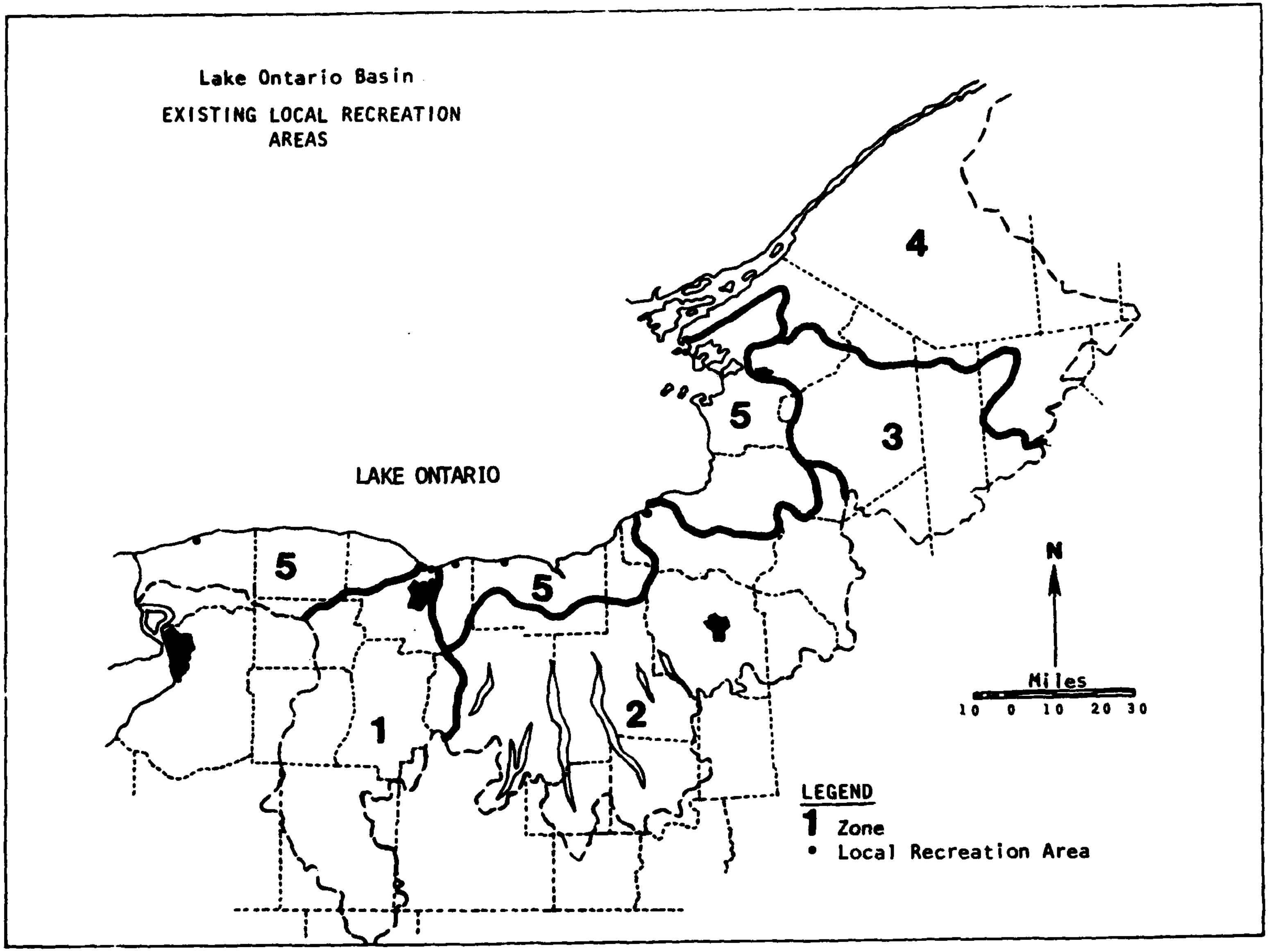


FIGURE 1 Extracted from U.S. Bureau of Outdoor Education, Oct. 1967

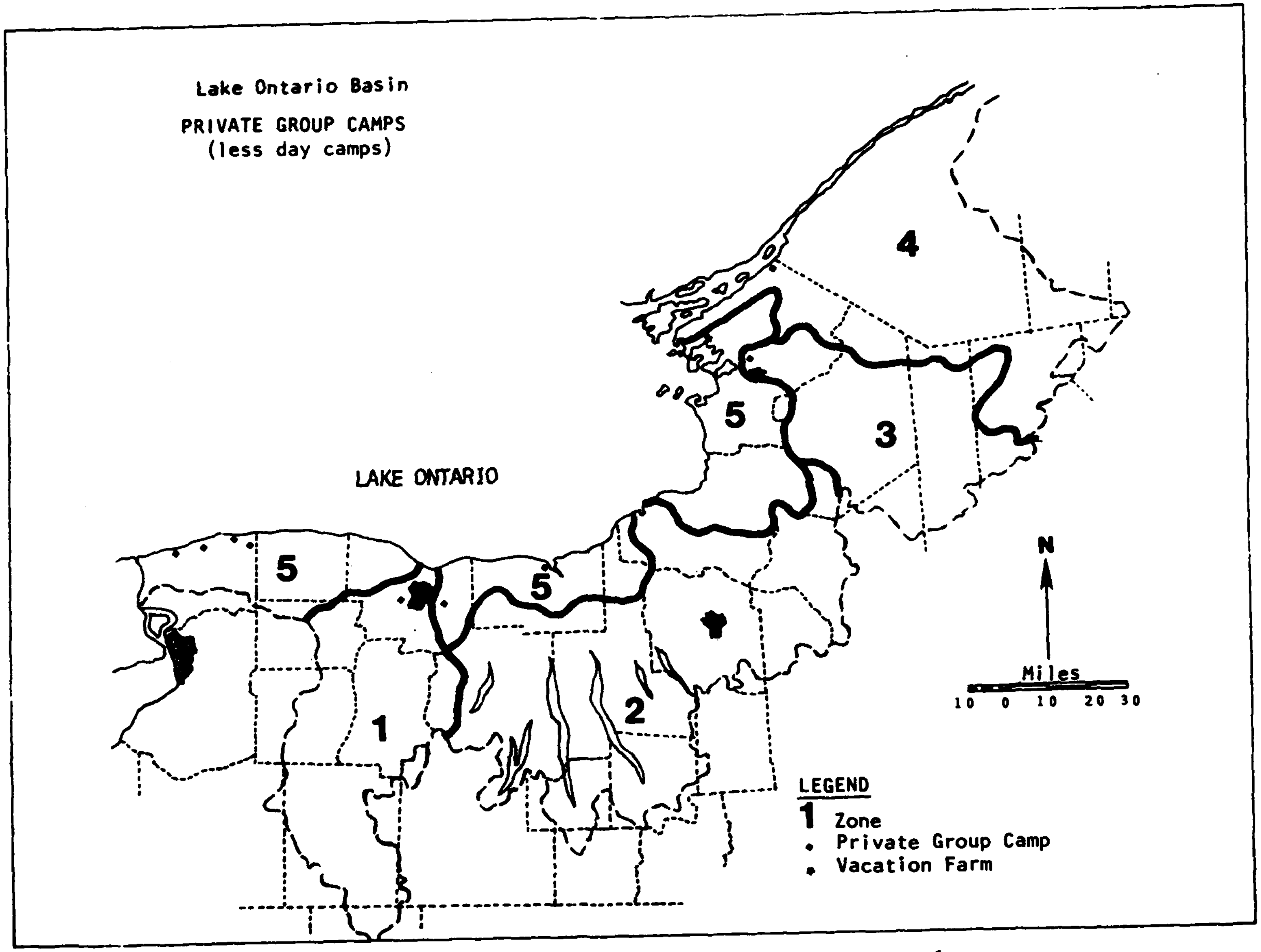


FIGURE 2 Extracted from U.S. Bureau of Outdoor Education, Oct. 1967

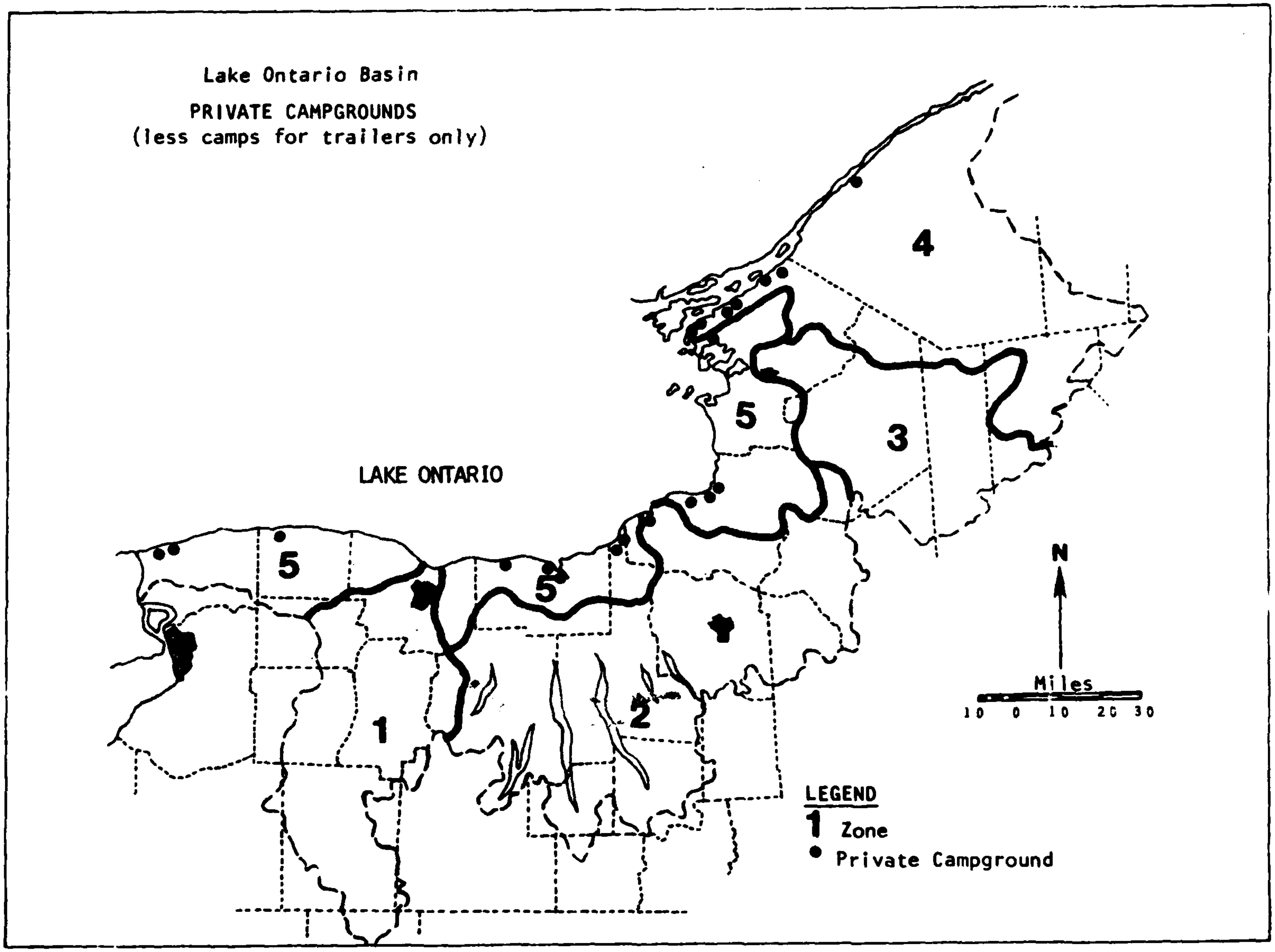


FIGURE 3 Extracted from U.S. Bureau of Outdoor Education, Oct. 1967

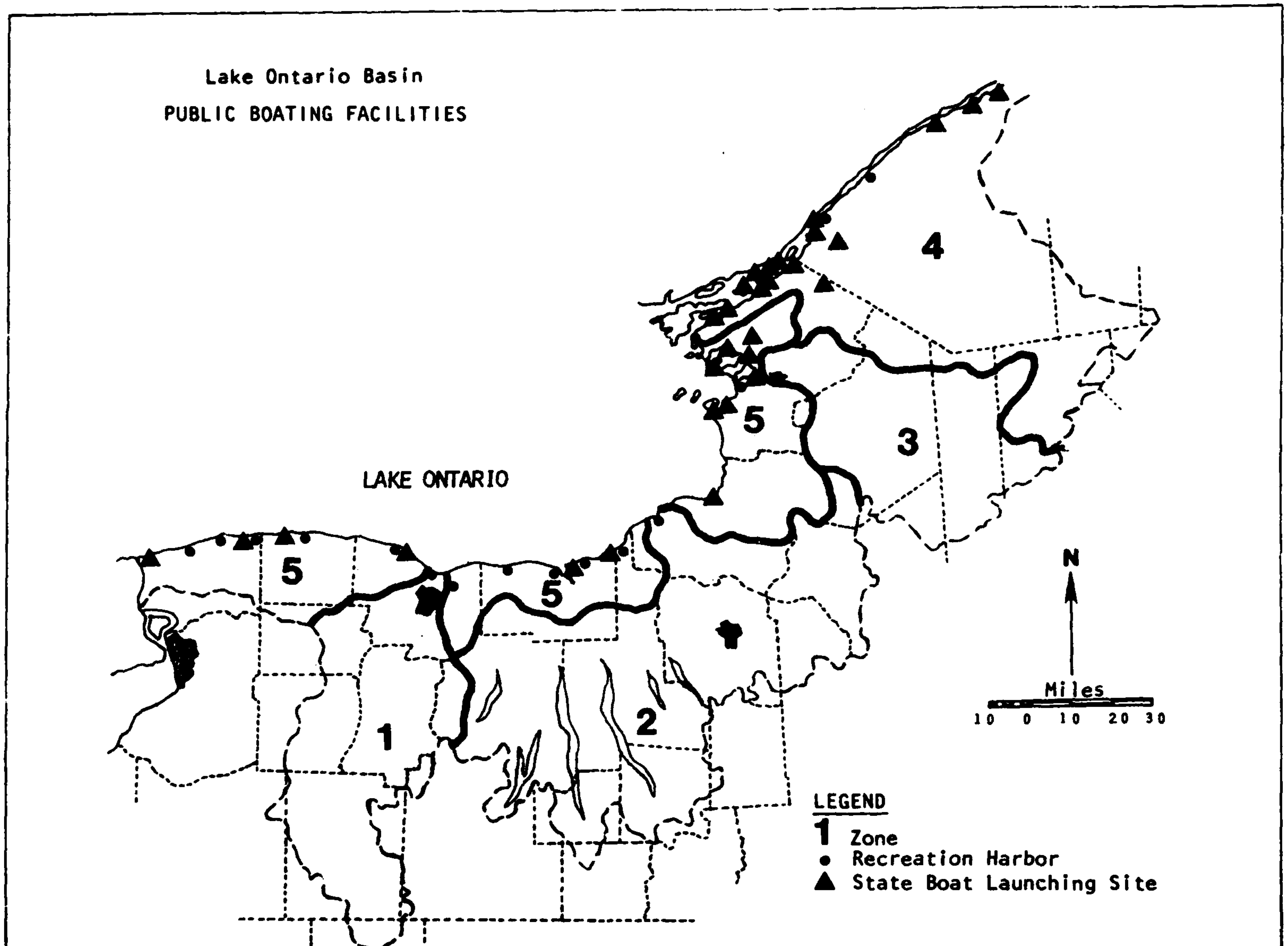


FIGURE 4 Extracted from U.S. Bureau of Outdoor Education, Oct. 1967

FIGURE 5
Extracted from IJC, May 1976

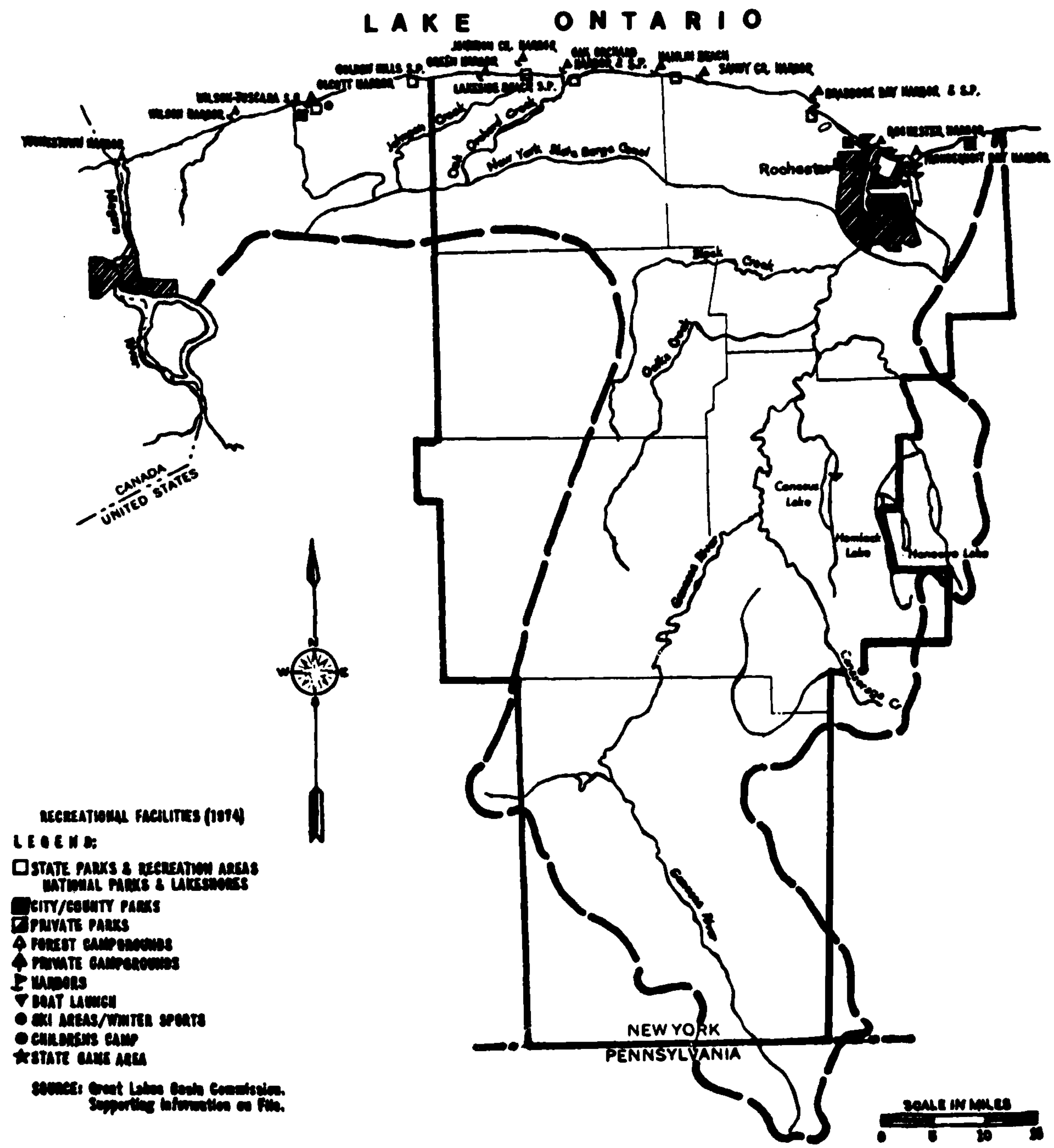


FIGURE 6
Extracted from Gennesee/Finger Lakes Regional Planning Board, Nov. 1972

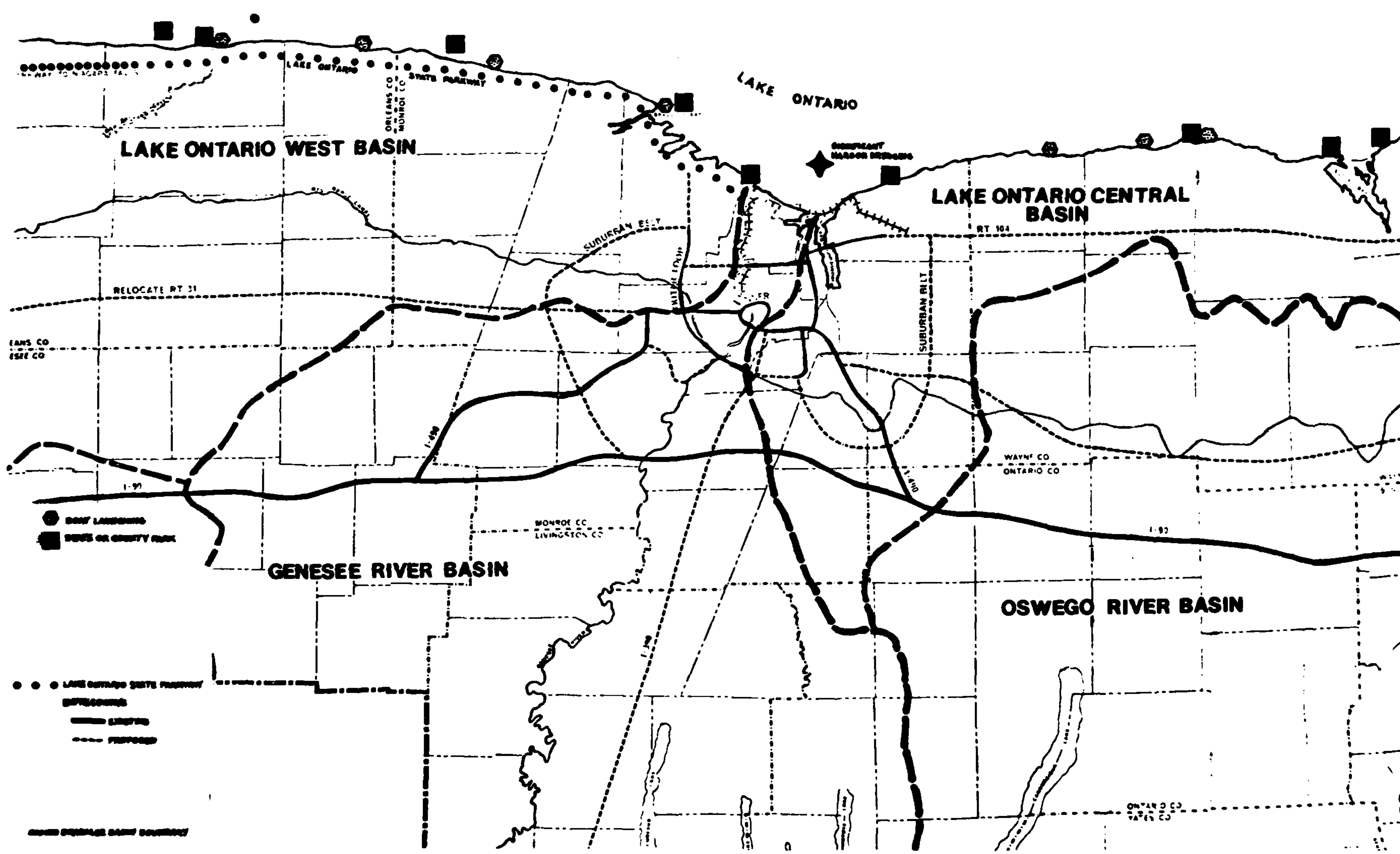
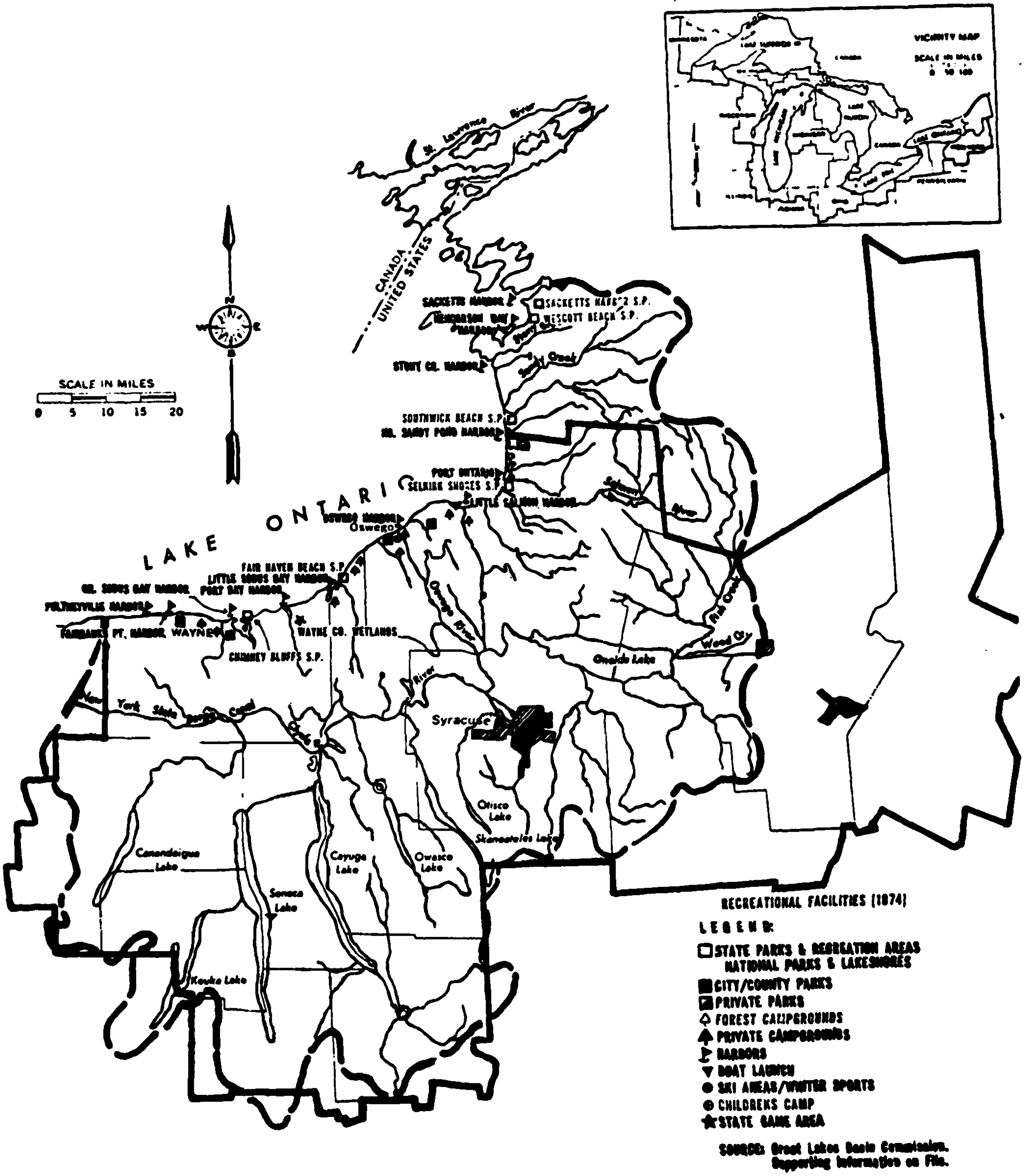


FIGURE 7
Extracted from IJC, May 1976



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BIRDS

The Lake Ontario Basin lies within the Atlantic Flyway for migrating birds, one of 4 such flyways in the United States. Many species avoid crossing large bodies of water during migration and choose to follow the shoreline. For this reason the Eastern Ontario - St. Lawrence area receives large concentrations of birds unequalled by most areas of North America.[40]

Birds are the most abundant vertebrates along the St. Lawrence River with over 260 species represented.[11] The river is an important nesting and wintering area for waterfowl. Two important nesting areas are the Great blue heron (Ardea herodias) rookery on Ironsides Island in the Town of Alexandria and the Ring-billed gull (Larus delawarensis) nesting area on Little Galoo Island near Sacketts Harbor.[37] Goshawks (Accipiter gentilis) are known to breed on Wellesly Island. Pigeon Island is the nesting site for several species, most importantly the Great Black-backed gull (Larus marnius). The Eaglewing Shoals are the nesting grounds for the Common tern (Sterna hirundo). High breeding densities have been found near Morristown and near Waddington at Coles Creek.[22]

The easterly reaches of the river from Waddington to Rooseveltown is the area most likely to be affected by water level changes. The creeks and shallow embayments here are home to a large variety of waterbirds in addition to gulls and osprey.[22]

Port Ontario, the mouth of the Salmon Rivers has been found to be the home of a large variety of species and the breeding area of the Snowy egret (Egretta shula), Least bittern (Ixobrychus

exilis) and Glossy ibis (Plegadis falcinellus). Deer Creek Marsh in Oswego is the breeding ground for many species and a migration stop for many more.

The principal nesting and resting areas in the Lake Ontario Basin are the Montezuma and Iroquois National Wildlife Refuges, the Finger Lakes, the State Oak Orchard and Tonawanda Games Management Areas, and the marshes and ponds along the shoreline in this area.[38] The Monroe County shoreline along Lake Ontario and the Genesee River attracts and supports large numbers of birds. Braddock Bay attracts migrating hawks, as well as water birds, herons and other marsh birds, owls and woodpeckers. Gulls are also attracted to the Irondequoit Bay area and the mouth of the Genesee River. Hamlin Beach State Park is a major nesting area for Bank swallows (Riparia riparia).[14]

Oak Orchard Swamp attracts the largest number of migrating Canada Geese (Branta canadensis) in New York State.[2]

The Niagara River is probably one of the best areas for viewing large numbers and a great variety of gulls. Sixteen species and one subspecies have been recorded here. Species known to breed here are the Herring gull (Larus argentatus), and the Ring-billed gull (Larus delawarensis).[1]

BIRDS OF THE LAKE ONTARIO NEARSHORE ZONE*

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
GAVIIDAE (loons)							
Gavia immer (Common loon)		X	X		0		
G. stellata (Red-throated loon)		0	0		0		
PODICIPEDIDAE (grebes)							
Podiceps grisengena (Red-necked grebe)		0	0		0		
P. auritus (Horned grebe)		0	0		0		
Podilymbus podiceps (Pied-billed grebe)	X	X	X		X		
Oceanodroma levcorhoa (Leach's pettrel)		0					
PROCELLARIIDAE (shearwaters, fulmars)							
Fulmarus glacialis (Northern fulmar)							
PELECANIDAE (pelicans)							
Pelecanus occidentalis (Brown pelican)		0					
P. erythrorhynchos (White pelican)		0					
PHALACROCORACIDAE (cormorants)							
Phalacrocorax auritus (Double-crested cormorant)		0	X	0	X		
P. carbo (Great cormorant)							
ARDEIDAE (herons and bitterns)							
Ardea herodias (Great blue heron)	0	X	X		X		
Butorides striatus (Green heron)	X	X	X		X		
Florida caerulea (Little blue heron)			0				
Bubulcus ibis (Cattle egret)		X	0		X		
Casmeroidius albus (Great egret)		0		0	X		
Egretta thula (Snowy egret)		0	0		0		
Hydramassa tricolor (Louisiana heron)							
Nycticorax nycticorax (Black-crowned night heron)		0	X		X		
Ixobrychus exilis (Least bittern)	X	X	X		X		
Botaurus lentiginosus (American bittern)	X	X	X		X		
Butorides virescens (Green Heron)		X					

*X =Breeds in area 0 =Found in area

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
THRESKIORNITHIDAE (ibises and spoonbills)							
<u>Plegadis</u> <u>falcinellus</u> (Glossy ibis)		0	0		0		
ANATIDAE (swans, geese, and ducks)							
<u>Cygnus</u> <u>olor</u> (Mute swan)		0	0		0		
<u>C.</u> <u>olor</u> <u>columbianus</u> (Whistling swan)	X	0	0		0	0	
<u>Branta</u> <u>canadensis</u> (Canada goose)		X	X	0	X		0
<u>B.</u> <u>bernicla</u> (Brant)		0	0		0		
<u>Chen</u> <u>caerulescens</u> (Snow goose)	0	0	0			0	
<u>Anas</u> <u>platyrhynchos</u> (Mallard)	X	X	X	X	X		
<u>A.</u> <u>rubripes</u> (Black duck)	X	X	X	X	X		
<u>A.</u> <u>strepera</u> (Gadwall)		X	0		0		
<u>A.</u> <u>acuta</u> (Pintail)		X	X		X		
<u>A.</u> <u>crecca</u> (American green-winged teal)		0	X		X		
<u>A.</u> <u>discors</u> (Blue-winged teal)	X	X	X	X	X		
<u>A.</u> <u>americana</u> (American wigeon)		X	0		X		
<u>A.</u> <u>clypeata</u> (Northern shoveler)		X	X		X		
<u>Aix</u> <u>sponsa</u> (Wood duck)	X	X	X		X		
<u>Aythya</u> <u>americana</u> (Redhead)		X	X		X		
<u>A.</u> <u>collaris</u> (Ring-necked duck)		0	0		X		
<u>A.</u> <u>valisineria</u> (Canvasback)		0	0		0		
<u>A.</u> <u>marila</u> (Greater scaup)		0	0	0	0		
<u>A.</u> <u>affinis</u> (Lesser scaup)		0	0	0	X		
<u>A.</u> <u>fuligula</u> (Tufted duck)							
<u>Bucephala</u> <u>clangula</u> (Common goldeneye)		0	0	0	X		
<u>B.</u> <u>islandica</u> (Barrows goldeneye)		0	0	0	0		
<u>B.</u> <u>albeola</u> (Bufflehead)	0	0	0	0	0		
<u>Clangula</u> <u>hyemalis</u> (Oldsquaw)	0	0	0	0	0		
<u>Histrionicus</u> <u>histrionicus</u> (Harlequin duck)	0						
<u>Somateria</u> <u>mallisima</u> (Common eider)		0	0		0		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Dear Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
ANATIDAE (Continued)							
Somateria spectabilis (King eider)		0	0		0		
Melanitta deglandi (White-winged scoter)		0	0		0		
M. fusca	0						
M. perspicillata (Surf scoter)		0	0		0		
M. nigra (Black scoter)		0			0		
Oxyura jamaicensis (Ruddy duck)		0	0		X		
Lophodytes cucullatus (Hooded merganser)		X	X		X		
Mergus merganser (Common merganser)	0	0	X		X		
M. serrator (Red-breasted merganser)	0	0	X	X	X		
Anser caerulescons (Blue goose)				0		0	
CATHARTIDAE (American vultures)							
Cathartes aura (Turkey vulture)	X	X	0		X		
Coragyps atratus (Black vulture)							
Elanoides forficatus (Swallow-tailed kite)							
ACCIPITRIDAE (hawks, Old World vultures, and harriers)							
Accipiter gentilis (Goshawk)		X	X		X		
A. striatus (Sharp-shinned hawk)	X	X	X		X		
A. cooperii (Cooper's hawk)	X	X	X		X		
Buteo jamaicensis (Red-tailed hawk)	X	X	X		X		
B. lineatus (Red-shouldered hawk)	0	0	X		0		
B. platypterus (Broad-winged hawk)	X	X	X		X		
B. swainsoni (Swainson's hawk)							
B. lagopus (Rough-legged hawk)		X	0		0		
Aquila chrysaetus (Golden eagle)			0		0		
Haliaeetus leucocephalus (Bald eagle)		X	0		X		
Circus cyaneus (Marsh hawk)	X	X	0		X		
PANDIONIDAE (ospreys)							
Pandion haliaetus (Osprey)		X	X		X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Dear Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
FALCONIDAE (caracars and falcons)							
Falco rusticolus (Gyrfalcon)		0	0		0		
F. peregrinus (Peregrine falcon)	0	0	0		0		
F. columbarius (Merlin)		0			0		
F. sparverius (American kestrel)	X	X			X		
Colinus virginianus (Bobwhite)		X	0				
TETRAONIDAE (grouse and ptarmigan)							
Bonasa umbellus (Ruffed grouse)	X	X					
PHASIANIDAE (quail, pheasants, and peacocks)							
Phasianus colchicus (Ring-necked pheasant)	X	X	0		X		
Perdix perdix (Gray partridge)		X					
Meleagris gallopavo (Turkey)		X	0				
RALLIDAE (rails, gallinules, and coots)							
Grus canadensis (Sandhill crane)							
Rallus limicola (Virginia rail)	X	X	X		0		
Porzana carolina (Sora)	X	X	X		0		
Gallinula chloropus (Common gallinule)	X	X	X	0	X		
Fulica americana (American coot)		0	X				
CHARADRIIDAE (plovers, turnstones, and surfbirds)							
Charadrius semipalmatus (Semipalmated plover)		0	0		0		
C. melodus (Piping plover)					X		
C. vociferus (Killdeer)	X	X	X	X	X		
Pluvialis dominica (American golden plover)		0	0	0	0		
P. squatarola (Black-bellied plover)		0	0		0		
Upland plover				0			
SCOLOPACIDAE (woodcock, snipe, and sandpipers)							
Arenarius interpes (Ruddy turnstone)		0	0	0	0		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Dear Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
SCOLOPACIDAE (Continued)							
Philohela minor (American woodcock)	X	X	X				
Capella gallinago (Common snipe)	X	X	X	X	X		
Scolopax minor (Woodcock)					X		
Numenius phaeopus (Whimbrel)		0		0			
Bartramia longicauda (Upland sandpiper)	X	X	X		X		
Actitis macularia (Spotted sandpiper)	X	X	X	X	X		
Tringa solitaria (Solitary sandpiper)		0	0		0		
T. melanoleucus (Greater yellowlegs)		0	0	0	0		
T. flavipes (Lesser yellowlegs)		0	0		0		
Catoptrophorus semipalmatus (Willet)			0				
Calidris canutus (Red knot)		0	0		0		
C. maritima (Purple sandpiper)		0	0		0		
C. melanotos (Pectoral sandpiper)		0	0		0		
C. fuscicollis (White rumped sandpiper)		0	0		0		
C. bairdii (Baird's sandpiper)		0	0		0		
C. minutilla (Least sandpiper)		0	0		0		
C. alpina (Dunlin)		0	0		0		
C. pusillus (Semipalmated sandpiper)		0	0		0		
C. mauri (Western sandpiper)		0	0		0		
C. alba (Sanderling)		0	0		0		
Limnodromus griseus (Short-billed dowitcher)		0	0	0	0		
L. scolopaceus (Long-billed dowitcher)		0	0	0	0		
Micropalama himantopus (Stilt sandpiper)		0	0		0		
Tryngites subruficollis (Buff-breasted sandpiper)		0	0		0		
Limosa fedoa (Marbled godwit)							
L. haemastica (Hudsonian godwit)		0		0			
Philomachs pugnax (Buff)					0		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
PHALAROPODIDAE (phalaropes)							
Phalaropus fulicarius (Red phalarope)		0	0		0		
Steganopus tricolor (Wilson's phalarope)		0	0		0		
Lobipes lobatus (Northern phalarope)		0	0		0		
STERCORARIIDAE (jaegers and skuas)							
Stercorarius pomarinus (Pomarine jaeger)							
S. parasiticus (Parasitic jaeger)			0		0		
S. longicaudus (Long-tailed jaeger)							
LARIDAE (gulls and terns)							
Larus hyperboreus (Glaucous gull)		0	0		0	0	0
L. glaucoides (Iceland gull)		0	0		0	0	0
L. marinus (Great black-backed gull)		0	0		0	0	0
L. argentatus (Herring gull)					X		0
L. delawarensis (Ring-billed gull)							0
L. fuscus (Lesser black-backed gull)							0
L. Thayeri (Thayer's gull)							0
L. Canus (Mew gull)							0
Pagophila eburnea (Ivory gull)							0
Xema sabini (Sabine's gull)							
Larus ridibundus (Black-headed gull)			0				0
L. atricilla (Laughing gull)							0
L. pipixcan (Franklin's gull)					0		0
L. philadelphia (Bonaparte's gull)		0	0		0		0
L. minutus (Little gull)							0
Rissa tridactyla (Black-legged kittiwake)		0			0		0
Sterna forsteri (Forster's tern)		0	0		0		
S. hirundo (Common tern)	X	X	X		X		
S. caspia (Caspian tern)		X	0		0		
Chlidonias niger (Black tern)	X	X	X		X		
Uria lomria (Thick-billed Murre)		0	0	0			

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
COLUMBIDAE (pigeons and doves)							
Columba livia (Rock dove)	X	X	0		X		
Zenaida macroura (Mourning dove)	X	X	X		X		
CUCULIDAE (cuckoos, roadrunners, and anis)							
Coccyzus americanus (Yellow-billed cuckoo)	X	X	X		X		
C. erythropthalmus (Black-billed cuckoo)	X	X	X		X		
STRIGIDAE (typical owls)		X	0		X		
Tyto alba (Barn owl)							
Otus asio (Screech owl)	X	X	0		X		
Bubo virginianus (Great horned owl)		X	0		X		
Nyctea scandiaca (Snowy owl)		0	0		0		
Surnia ulula (Hawk owl)	X				0		
Strix varia (Barred owl)		0	0		X		
Asio otus (Long-eared owl)		X	0		X		
A. flammeus (Short-eared owl)		X	0		X		
Aegolius funereus (Boreal owl)		0	0		X		
A. acadicus (Saw-whet owl)		0	0				
Strix nebulosa (Great gray owl)					0		
CAPRIMULGIDAE (goatsuckers)							
Caprimulgus vociferus (Whip-poor-will)	X	X	X		X		
Chordeiles minor (Common nighthawk)	X	X	X		X		
APODIDAE (swifts)							
Chaetura pelagica (Chimney swift)	X	X	X		X		
TROCHILIDAE (hummingbirds)							
Archilochus colubris (Ruby-throated hummingbird)	X	X	X		X		
ALCEDINIDAE (kingfishers)							
Megaceryle alcyon (Belted kingfisher)	X	X	X		X		
Ceryle alcyon (Belted kingfisher)							

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
PICIDAE (woodpeckers and wrynecks)							
Colaptes auratus (Common flicker)	X	X	X		0		
Dryocopus pileatus (Pileated woodpecker)	X	X	0		0		
Centurus carolinus (Red-bellied woodpecker)	X	0	0		0		
Melanerpes erythrocephalus (Red-headed woodpecker)	X	X	X		0		
Sphyrapicus varius (Yellow-bellied sapsucker)	0	0	X		0		
Picoides villosus (Hairy woodpecker)	X	X	0		0		
P. pubescens (Downy woodpecker)	X	X	0	0	X		
P. arcticus (Black-backed three-toed woodpecker)		0	0				
P. tridactylus (Northern three-toed woodpecker)		0	0				
TYRANNIDAE (tyrant flycatchers)							
Tyrannus tyrannus (Eastern kingbird)	X	X	X		X		
Myiarchus crinitus (Great crested flycatcher)	X	X	X		0		
Sayornis phoebe (Eastern phoebe)	X	X	X		X		
Empidonax flaviventris (Yellow-bellied flycatcher)		0	0		0		
E. virescens (Acadian flycatcher)							
E. traillii (Willow flycatcher)	X	X			X		
E. alnorum (Alder flycatcher)	X	X					
E. minimus (Least flycatcher)	X	X	X		X		
Contopus virens (Eastern wood pewee)	X	X	X		X		
Nuttallornis borealis (Olive-sided flycatcher)		0	X		X		
ALAUDIDAE (larks)							
Eremophila alpestris (Horned lark)	X	X	0		X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
HIRUNDINIDAE (swallows)							
Iridoprocne bicolor (Tree swallow)	X	X	X		X		
Riparia riparia (Bank swallow)	X	X	X		X		
Stelgidopterx ruficollis (Rough-winged swallow)	X	X	X		X		
Hirundo rustica (Barn swallow)	X	X	X		X		
Petrochelidon pyrrhonota (Cliff swallow)		0	X		X		
Progne subis (*Purple martin*)	X	X	X		X		
CORVIDAE (jays, magpies, and crows)							
Cyanocitta cristata (Blue jay)	X	X	0		X		
Corvus corax (Common raven)		0	0		0		
C. brachyrhynchos (Common crow)	X	X	X		X		
Perisoreus canadensis (Gray jay)		0	0				
PARIDAE (titmice, verdins, and bushtits)							
Parus atricapillus (Black-capped chickadee)	X	X	X		X		
P. hudsonicus (Boreal chickadee)		0	0		0		
P. bicolor (Tufted titmouse)	X		0		0		
SITTIDAE (nuthatches)							
Sitta carolinensis (White-breasted nuthatch)	X	X	0		0		
S. canadensis (Red-breasted nuthatch)	X	X	X		X		
CERTHIIDAE (creepers)							
Certhia familiaris (Brown creeper)	X	X	X		X		
TROGLODYTIDAE (wrens)							
Troglodytes aedon (House wren)	X	X	X		X		
T. troglodytes (Winter wren)	X	X	X		X		
T. ludovicianus (Carolina wren)	X	0	X		X		
Cistothorus palustris (Long-billed marsh wren)	X	X			X		
C. platensis (Short-billed marsh wren)					X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
MIMIDAE (mockingbirds and thrashers)							
Mimus polyglottus (Mockingbird)		0	X		0		
Dumetella carolinensis (Gray catbird)	X	X	X		X		
Toxostoma rufum (Brown thrasher)	X	X	X		X		
Oreoscoptes montanus (Sage thrasher)		0					
TURDIDAE (thrushes, solitaires, and bluebirds)							
Turdus migratorius (American robin)	X	X	X		X		
Hylocichla mustelinus (Wood thrush)	X	X	X		X		
Catharus guttatus (Hermit thrush)	0	0	X		X		
C. ustulatus (Swainson's thrush)	0	0	X		0		
C. minimus (Gray-cheeked thrush)		0	0		0		
C. fuscescens (Veery)	X	X	X		X		
Sialia sialis (Eastern bluebird)	X	X	X		X		
SYLVIIDAE (Old World warblers, gnatcatchers, and kinglets)							
Polioptila caerulea (Blue-gray gnatcatcher)	X	0	0		0		
Regulus satrapa (Golden-crowned kinglet)	X	0	X		X		
R. calendula (Ruby-crowned kinglet)	0	0	0		0		
MOTACILLIDAE (wagtails and pipits)							
Anthus spinoletta (water pipit)	0	0	0		0		
BOMBYCILLIDAE (waxwings)							
Bombicilla garulus (Bohemian waxwing)		0	0		0		
B. cedrorum (Cedar waxwing)	X	X	X	0	0		
LANIIDAE (shrikes)							
Lanius excubitor (Northern shrike)	0	0	0		0		
L. ludovicianus (Loggerhead shrike)		0	X		X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
STURNIDAE (starlings)							
Sturnus vulgaris (Starling)	X	X	0		X		
VIREONIDAE (vireos)							
Vireo flavifrons (Yellow-throated vireo)	X	X	X		X		
V. solitarius (Solitary vireo)		0	X		0		
V. olivaceus (Red-eyed vireo)	X	X	X		X		
V. philadelphicus (Philadelphia vireo)		0	0		0		
V. gilvus (Warbling vireo)	X	X	X		X		
V. griseus (White-eyed vireo)		0					
PARULIDAE (wood warblers)							
Mniotilta varia (Black-and-white warbler)	X	X	X		X		
Protonotaria citrea (Prothonotary warbler)							
Helmitheros vermivorus (Worm-eating warbler)			0				
Vermivora chrysoptera (Golden-winged warbler)	X	0	0		0		
V. pinus (Blue-winged warbler)	X		0				
V. peregrina (Tennessee warbler)	0	0	0		0		
V. celata (Orange-crowned warbler)		0	0		0		
V. ruficapilla (Nashville warbler)	0	0	X		0		
Parula americana (Northern parula)		0	0		0		
Dendroica petechia (Yellow warbler)	X	X	X		X		
D. magnolia (Magnolia warbler)	0	0	X		0		
D. tigrina (Cape May warbler)		0	0		0		
D. caerulescens (Black-throated blue warbler)	0	X	X		X		
D. coronata (Yellow-rumped warbler)	0	0			X		
Myrtle warbler			X				
Dendroica virens (Black-throated green warbler)	X	X	X		X		
D. cerulea (Cerulean warbler)	X	0	X		X		
D. fusca (Blackburian warbler)	X	X	X		X		
D. dominica (Yellow-throated warbler)							
D. pennsylvanica (Chestnut-sided warbler)	X	X	X		X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
PARULIDAE (Continued)							
Seiurus motacilla (Louisiana waterthrush)							
Dendroica castenea (Bay-breasted warbler)	0	0	0		0		
D. striata (Blackpoll warbler)	0	0	0		0		
D. pinus (Pine warbler)	X	X	X		X		
D. discolor (Prairie warbler)							
D. palmarum (Palm warbler)		0	0		0		
Seiurus aurocapillus (Ovenbird)	X	X	X		X		
S. noveboracensis (Northern waterthrush)	X	X	X		X		
S. motacilla (Louisiana waterthrush)			X		X		
Oporornis philadelphia (Mourning warbler)	X	X	X		X		
Geothlypis trichas (Common yellowthroat)	X	X	X		X		
Wilsonia citrina Hooded warbler)	X		0		X		
W. pusilla (Wilson's warbler)	0	0	0		0		
W. canadensis (Canada warbler)	X	X	X		X		
Setophaga ruticilla (American redstart)	X	X	X		X		
PLOCEIDAE (weaver finches)							
Passer domesticus (House sparrow)	X	X			X		
ICTERIDAE (meadowlarks, blackbirds, and orioles)							
Dolichonyx oryzivorus (Bobolink)	X	X	X		X		
Sturnella magna (Eastern meadowlark)	X	X	X		X		
S. neglecta (Western meadowlark)	X	0					
Agelaius phoeniceus (Red-winged blackbird)	X	X	X		X		
Icterus spurius (Orchard oriole)		0					
I. galbula (Northern oriole)	X	X			X		
Baltimore oriole			X				
Euphagus carolinus (Rusty blackbird)		0	0		0		
Quiscalus quiscula (Common grackle)	X	X	X		X		
Molothrus ater (Brown-headed cowbird)	X	X	X		X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
THRAUPIDAE (tanagers)							
Piranga olivacea (Scarlet tanager)		X	X		X		
FRINGILLIDAE (grosbeaks, finches, sparrows, and buntings)							
Cardinalis cardinalis (Cardinal)	X	X	X		X		
Pheucticus ludovicianus (Rose-breasted grosbeak)	X	X	X		X		
Passerina cyanea (Indigo bunting)	X	X	X		0		
Spiza americana (Dickcissel)		0					
Hesperiphona vespertina (Evening grosbeak)		0	0		0		
Carpodacus purpureus (Purple finch)	X	X	0		0		
C. mexicanus (House finch)	X						
Pinicola enucleator (Pine grosbeak)		0	0		0		
Acanthis hornemannii (Hoary redpoll)		0	0		0		
A. flammea (Common redpoll)		0	0				
Carduelis pinus (Pine siskin)		0	0		0		
C. tristis (American goldfish)	X	X	X		X		
Loxia curvirostra (Red crossbill)		0	0		0		
L. leucoptera (White-winged crossbill)		0	0		0		
Pipilo erythrophthalmus (Rufous-sided towhee)	X	X	X		X		
Passerculus sandwichensis (Savannah sparrow)							
Ammodramus sandwichensis (Savannah sparrow)	X	X	X		X		
A. savannarum (Grasshopper sparrow)	X	0	X				
A. henslowii (Henslow's sparrow)	X	X	X		0		
Ammospiza caudacuta (Sharp-tailed sparrow)	X	X	X		X		
Pooecetes gramineus (Vesper sparrow)	X	X	X		X		
Junco hyemalis (Dark-eyed junco)							
Spizella arborea (Tree sparrow)	X	0	0		0		
S. passerina (Chipping arrow)	X	X	X		X		
S. pallida (Gray-colored sparrow)							
S. pussila (Field sparrow)	X	X	X		X		

	New Haven (Oswego Co.)	St. Lawrence R.	Eastern Ontario	Deer Cr. Marsh (Oswego Co.)	Pt. Ontario (Oswego Co.)	Oak Orchard Swamp	Niagara Frontier
FRINGILLIDAE (Continued)							
Zonotrichia querula (Harris's sparrow)							
Z. leucophrys (White-crowned sparrow)	O	O	O		O		
Z. albicollis (White-throated sparrow)	X	X	X		X		
Passerella iliaca (Fox sparrow)		O	O		O		
Melospiza lincolnii (Lincoln's sparrow)	O	O	X		O		
M. georgiana (Swamp sparrow)	X	X	X		X		
M. melodia (Song sparrow)	X	X	X		X		
Calcarius lapponicus (Lapland longspur)		O	O		O		
Plectrophenax nivalis (Snow bunting)		O	O		O		

MAMMALS

The Lake Ontario basin has always supported an abundant and varied wildlife population. Although no historical information is available on the region before the arrival of European settlers, the number of Indian settlements in the area are witness to the abundance of wildlife. The coming of the settlements marked the beginning of major changes in habitat and a resultant decline in wildlife. The recent trend toward reforesting previously cleared land is providing increasing habitat, thereby enabling many species to survive.

The most important species economically is the muskrat (Ondatra zibethicus). Mink (Mustela vison) also contribute to the economy of the region.[11]

Although most species exist in sufficient numbers to avoid being completely eliminated by fluctuations in water levels, a drastic increase or decrease in any species would have an impact on dependent predator species.

MAMMALS

	St. Lawrence R.	Eastern Ontario	New Haven	Deer Cr. Marsh (Oswego Co.)	Monroe Co.	Niagara Co.
MARSUPIALIA						
Didelphis virginiana (Oppossum)	X	X	X	X	X	X
LAGOMORPHA						
Lepus americanus (Snowshoe hare)	X	X				
L. europaeus (European hare)	X					
Sylvilagus floridanus (Eastern cottontail)	X	X	X			X
RODENTIA						
Castor canadensis (American beaver)	X	X		X		
Ondatra zibethicus (Muskrat)	X	X	X	X	X	X
Rattus norvegicus (Norway rat)	X		X			
Microtus pennsylvanicus (Meadow vole)	X		X			
Peromyscus leucopus (White-footed mouse)	X		X			
Tamias striatus (Eastern chipmunk)	X	X	X	X		
Zapus hudsonius (Meadow jumping mouse)	X		X			
INSECTIVORA						
Blarina brevicauda (Short-tailed shrew)	X		X			
Microcorex hoyi (Pigmy shrew)	X					
Sorex palustris (Water shrew)	X	X				
Condylura cristata (Star-nosed mole)	X	X				
Parascalops breweri (Hairy-tailed mole)	X					
CARNIVORA						
Procyon lotor (Raccoon)	X	X	X	X	X	X
Lontra canadensis (River otter)	X	X		X		X
Felis concolor (Mountain lion)	X					
Lynx rufus (Bobcat)	X	X		X		
Odocoileus virginianus (White-tailed deer)	X	X	X	X	X	X
Cervus elaphus (American elk)	X					
Alces alces (Moose)	X					

	St. Lawrence R.	Eastern Ontario	New Haven	Deer Cr. Marsh (Oswego Co.)	Monroe Co.	Niagara Co.
CARNIVORA (Continued)						
<u>Martes pennanti</u> (Fisher)	X	X		X		
<u>Mustela erminea</u> (Ermine)	X					
<u>M. frenata</u> (Long-tailed weasel)	X		X	X		
<u>M. vison</u> (American mink)	X	X		X	X	X
<u>Canis latrans</u> (Coyote)	X	X				
<u>C. lupus</u> (Wolf)	X					
<u>Urocyon cinereoargenteus</u> (Gray fox)	X	X		X		
<u>Vulpes vulpes</u> (Red fox)		X		X		
<u>Ursus americanus</u> (Black bear)	X					

AMPHIBIANS AND REPTILES

Amphibians and reptiles are inhabitants of the aquatic interface, spending some of their life on land and some in the water. They are extremely sensitive to change in the littoral area. As little commercial value is placed on these species, little research has been done. Studies on the Lake Ontario Basin have concentrated on the St. Lawrence River, and the eastern basin around the mouth of the Salmon River at Port Ontario. Reports of research from areas west of this point are incomplete or non-existent.

REPTILES AND AMPHIBIANS

	St. Lawrence R.	Eastern Ontario	Pt. Ontario	Hamlin Beach
NECTURIDAE (mudpuppies)				
Necturus maculosus (Mudpuppy)	X		X	
AMBYSTOMATIDAE (mole salamanders)				
Ambystoma laterale (Blue-spotted salamander)	X		X	
A. jeffersonianum (Jefferson salamander)	X		X	
A. maculatum (Spotted salamander)	X		X	
SALAMANDRIDAE (newts)				
Notophthalmus viridescens viridescens (Red-spotted newt)	X		X	
PLETHODONTIDAE (lungless salamanders)				
Desmognathus fuscus fuscus (Northern dusky salamander)	X		X	
Plethodon cinereus cinereus (Red-backed salamander)	X		X	
Hemidactylium scutatum (Four-toed salamander)	X		X	
Eurycea bislineata bislineata (Northern two-lined salamander)	X		X	
BUFONIDAE (toads)				
Bufo americanus (American toad)	X		X	X
HYLIDAE (tree frogs)				
Hyla crucifer (Spring peeper)	X		X	X
H. crucifer crucifer (Eastern gray tree frog)	X		X	
H. versicolor (Gray tree frog)	X		X	
Pseudacris triseriata triseriata (Western chorus frog)	X		X	

	St. Lawrence R.	Eastern Ontario	Pt. Ontario	Hamlin Beach
RANIDAE (true frogs)				
Rana catesbeiana (Bullfrogs)	X		X	
R. clamitans melanota (Greenfrog)	X		X	
R. septentrionalis (Mink frog)	X		X	
R. sylvatica (Wood frog)	X		X	
R. pipiens (Northern leopard frog)	X		X	X
R. palustris (Pickerel frog)	X		X	
CHELYDRIDAE (snapping turtles)				
Chelydra serpentina (Snapping turtle)	X	X	X	
KINOSTERNIDAE (mud or musk turtles)				
Sternotherus odoratus (Stinkpot)	X	X	X	
TRIONYCHIDAE (soft-shelled turtles)				
Trionyx spinifer (Eastern spring soft-shell turtle)			X	
EMYDIDAE (box or water turtles)				
Terrapene carolina carolina (Eastern box turtle)	X			
Graptemys geographica (Map turtle)	X	X	X	
Chrysemys picta marginata (Midland painted turtle)	X	X		
Emydoidea blandingi (Blanding's turtle)	X		X	
SCINCIDAE (skinks)				
Eumeces fasciatus (Five-lined skink)	X			

	St. Lawrence R.	Eastern Ontario	Pt. Ontario	Hamlin Beach
COLUBRIDAE (colubrids)				
Natrix sipedon sipedon (Northern water snake)	X	X	X	X
Storeria dekayi dekayi (Northern brown snake)	X	X	X	
S. occipitomaculata (Red-bellied snake)	X	X	X	
Thamnophis sirtalis sirtalis (Eastern garter snake)	X	X	X	X
T. sauritus septentrionalis (Northern ribbon snake)	X		X	
Diadophis punctatus edwardsi (Northern ringneck snake)	X	X	X	
Opheodrys vernalis (Smooth green snake)	X	X	X	
Elaphe obsoleta obsoleta (Black rat snake)	x		x	x
Lampropeltis triangulum triangulum (Eastern milk snake)	X	X	X	
TESTUDINIDAE (wood and pond turtles)				
Clemmys insculpta (Wood turtle)			X	
C. guttata (Spotted turtle)			X	
C. muhlenbergii (Bog turtle)			X	
Chrysemys picta (Painted turtle)			X	

FISH

I. HISTORY

Lake Ontario supports a large variety of species of fish. Before the coming of the first white settlers the fish of the nearshore zone were a major part of the food supply of the Indians who visited the coastal zone on yearly fishing trips.

Early settlers were using seine nets as early as 1807. Overfishing, together with other aspects of man's activity, have drastically altered the species composition of the Lake Ontario fishery. Dams built in streams to run gristmills blocked migrations. As land was cleared for settlement, the streams became siltier and warmer. The discharge of municipal and industrial wastes began to contribute to the eutrophication of the coastal zone before 1900. By the beginning of the twentieth century, certain species had become virtually extinct, namely the Lake sturgeon (Acipenser fulvescens), Atlantic salmon (Salmo salar) and the Blackfin cisco (Coregonus nigripinnis). This century has witnessed the decline of other species: Lake trout (Salvelinus namaycush), Shortnose cisco (Coregonus reighardi), Bloater (Coregonus kiyi), Burbot (Lota lota), Blue pike (Stizostedion vitreum glaucum) and Fourhorn sculpin (Myoxocephalus quadricornis).[20]

New species of fish have entered the lake with varying degrees of success. Entering the lake before 1900 were the Alewife (Alosa pseudoharengus), Gizzard shad (Dorosoma cepedianum), Brown trout (Salmo trutta), Carp (Cyprinus carpio), and Goldfish (Carassius auratus). Joining them after 1900 were the Rainbow trout (Salmo gairdneri), Rainbow smelt (Osmerus mordax), and White

perch (Morone americana)[10]

II. SPAWNING GROUNDS

Protection of vital spawning areas is a large factor in restoring Lake Ontario's potential as a major fish producer. Numerous spawning grounds have been identified in the coastal zone, most research being concentrated in the eastern basin.

Inshore areas and tributary streams of the Eastern Ontario - St. Lawrence provide spawning and nursery habitat for several forage species such as the Alewife (Alosa pseudoharengus), Slimy sculpin (Cottus cognatus), Rainbow smelt (Osmerus mordax) and various minnows (family Cyprinidae). Several important sport fish spawn in this area. Smallmouth bass (Micropterus dolomieui) prefer to spawn on gravel, rocky or sandy bottoms, while Yellow perch (Perca flavescens) prefer weedy areas. The preference of the Northern pike (Esox lucius) for flooded grasslands or wetlands makes fluctuations in water levels critical for spawning success. Similar spawning grounds are used by Muskellunge (Esox masquinongy). Brown bullheads (Ictalurus nebulosus) prefer a sand, gravel or mucky bottom in shallow littoral areas, as do Rock bass (Ambloplites rupestris), Pumpkinseed sunfish (Lepomis gibbosus), and Largemouth bass (Micropterus salmoides). White perch (Morone americana) and White bass (Morone chrysops) spawn inshore or in shallow tributary streams. Walleye pike (Stizostedion vitreum) spawn in clear water on shoals or in streams with sand or gravel bottoms[10]

The Salmon River is a spawning area for Coho salmon (Oncorhynchus kisutch) and Chinook salmon (Oncorhynchus tshawytscha).

A number of species are known to spawn in the Salmon River.

Among these are the Northern pike (Esox lucius), Brown bullhead (Ictalurus nebulosus), Smallmouth bass (Micropterus dolomieui) and Black crappie (Pomoxis nigromaculatus).[39]

Sodus Creek is one of 17 creeks that serve as spawning grounds for Sea lamprey (Petromyzon marinus) on the United States shore of Lake Ontario. Only 25% of this species spawns in United States creeks and none takes place west of Sodus Bay.

The site of the Ginna Nuclear Power Generating Station in Wayne County has been found to be a spawning area for Smelt (Osmerus mordax) and Spottail shiners (Notropis hudsonius).[28]

The coastal zone of Monroe County near the site of the Russell Electric Power Generating Station is a spawning area favored by several species, namely Alewives (Alosa pseudoharengus), Spottail shiners (Notropis hudsonius), Rainbow smelt (Osmerus mordax), Carp (Cyprius carpio), and Smallmouth bass (Micropterus dolomieui).[29]

Most streams in Niagara County do not provide suitable fish habitat although some warm water species are found near the mouths of streams.[9]

FISH IN THE LAKE ONTARIO NEARSHORE ZONE

	New Haven	St. Lawrence	Russell	Oswego	Eastern Ontario	Salmon River	Ginna	Mexico Bay
CATOSTOMIDAE (suckers)								
Catostomus commersoni (White sucker)	X	X	X	X		X		
Hypentelium nigricans (Northern hog sucker)	X					X		
Erimyzon oblongus (Creek chubsucker)	X					X		
Moxostoma valenciennesi (Greater redhorse)		X	X					
ICTALURIDAE (freshwater catfishes)								
Ictalurus nebulosus (Brown bullhead)	X	X	X	X	X	X		
Notorus flavus (Stonecat)	X					X		
Ictalurus punctatus		X						
PERCOPSIDAE								
Percopsis omiscomaycus (Trout-perch)	X	X						
GASTEROSTERIDAE (sticklebacks)								
Gasterosteus aculeatus (Threespine stickleback)	X							
Culaea inconstans (Brook stickleback)	X	X						
PERCICHTHYIDAE (temperate basses)	X							
Morone americana (White perch)	X		X	X	X	X	X	X
M. chrysops (Whitebass)		X	X		X	X		
PETROMYZONTIDAE (lampreys)	X	X				X		
Petromyzon marinus (Sea lamprey)		X						
Ichthyomyzon fossor (Northern brook lamprey)								
AMIIDAE (bowfins)								
Amia calva (bowfin)	X	X				X		
ANGUILLIDAE (freshwater eels)								
Anguilla rostrata (American eel)	X	X				X		
CLUPEIDAE (herrings)								
Alosa pseudoharengus (Alewife)	X	X	X	X	X	X	X	
Dorosoma cepedianum (Gizzard shad)	X	X	X			X		
Alosa sapidissima								

	New Haven	St. Lawrence	Russell	Oswego	Eastern Ontario	Salmon River	Ginna	Mexico Bay
SALMONIDAE (trouts)								
Coregonus artedii (Lake herring)	X	X						
Oncorhynchus kisutch (Coho salmon)	X	X	X			X	X	
O. nerka (Sockeye salmon)		X				X		
O. tshawytscha (Chinook salmon)	X	X				X		
Salmo gairdneri (Rainbow trout)	X	X	X			X		
S. salar (Atlantic salmon)						X		
S. trutta (Brown trout)	X	X	X			X	X	
Salvelinus fontinalis (Brook trout)		X				X		
S. namaycush (Lake trout)	X	X				X		
Coregonus clupeaformis (Lake whitefish)		X						
C. hoyi (Bloater)								
C. kiyi (Kiyi)								
OSMERIDAE (smelts)								
Osmerus mordax (Rainbow smelt)	X	X	X	X	X	X	X	X
ESOCIDAE (pikes)								
Esox lucius (Northern pike)	X	X	X	X	X	X	X	
E. americanus vermiculatus (Grass pickerel)	X	X				X		
E. masquinongy (Muskellunge)		X			X			
E. niger (Chain pickerel)		X						
CENTRARCHIDAE (sunfishes)								
Ambloplites rupestris (Rock bass)	X	X	X	X	X	X		
Lepomis gibbosus (Pumpkinseed)	X	X		X	X	X	X	
L. macrochirus (Bluegill)	X	X		X		X		
Micropterus dolomieui (Smallmouth bass)	X	X	X	X	X	X	X	
M. salmoides (Largemouth bass)	X	X			X	X		
Pomoxis nigromalatus (Black crappie)	X	X				X		

	New Haven	St. Lawrence	Russell	Oswego	Eastern Ontario	Salmon River	Ginna	Mexico Bay
PERCIDAE (perches)								
Etheostoma olmstedi (Tessellated darter)	X	X				X		
Perca flavescens (Yellow perch)	X	X	X	X	X	X		X
Etheostoma flabellare (Fantail darter)	X	X				X		
Percina caprodes (Logperch)	X	X						
P. copelandi (Channel darter)		X						
Stizostedion vitreum vitreum (Walleye)	X	X	X	X	X			
SCIAENIDAE (drums)								
Aplodinotus grunniens (Freshwater drum)	X		X					
COTTIDAE (sculpins)								
Cottics bairdi (Mottled sculpin)	X							
C. cognatus (Slimy sculpin)	X				X			
UMBRIDAE (mudminnows)								
Umbra limi (Central mudminnow)	X	X						
CYPRINODONTIDAE (killifishes)								
Fundulus diaphanus (Banded killifish)	X	X				X		
ATHERINIDAE (silversides)								
Labidesthes sicculus (Brook silverside)	X	X						
ACIPENSERIDAE (sturgeons)								
Acipenser fulvescens (Lake sturgeon)		X						
LEPISOSTEIDAE (gars)								
Lepisosteus osseus (Longnose gar)		X	X			X		
HIODONTIDAE (mooneyes)								
Hiodon tergisus (Mooneye)		X						

	New Haven	St. Lawrence	Russell	Oswego	Eastern Ontario	Salmon River	Ginna	Mexico Bay
CYPRINIDAE (minnows and carps)								
<u>Campostoma</u> <u>anomalum</u> (Stoneroller)								
<u>Carassius</u> <u>auratus</u> (Goldfish)	X							
<u>Clinostomus</u> <u>elongatus</u> (Redside dace)								
<u>Couesius</u> <u>plumbeus</u> (Lake chub)	X							
<u>Cyprinus</u> <u>carpio</u> (Carp)	X	X	X			X		
<u>Exoglossum</u> <u>maxillingua</u> (Cutlips minnow)	X							
<u>Hybognathus</u> <u>hankinsoni</u> (Brassy minnow)								
<u>H.</u> <u>nuchalis</u> (Silvery minnow)	X							
<u>Hybopsis</u> <u>plumbeus</u> (Lake chub)						X		
<u>Notemigonus</u> <u>crysoleucas</u> (Golden shiner)	X	X	X			X		
<u>Notropis</u> <u>analostanus</u> (Satinfin shiner)								
<u>N.</u> <u>anogenus</u> (Pugnose shiner)								
<u>N.</u> <u>atherinoides</u> (Emerald shiner)	X	X				X		
<u>N.</u> <u>bifrenatus</u> (Brikle shiner)	X	X				X		
<u>N.</u> <u>cornutus</u> (Common shiner)	X	X				X		
<u>N.</u> <u>heterodon</u> (Blackchin shiner)		X						
<u>N.</u> <u>heterolepis</u> (Blacknose shiner)		X						
<u>N.</u> <u>hudsonius</u> (Spottail shiner)	X	X	X	X		X	X	
<u>N.</u> <u>rubellus</u> (Rosyface shiner)								
<u>N.</u> <u>spilopterus</u> (Spotfin shiner)		X						
<u>N.</u> <u>stramineus</u> (Sand shiner)		X				X		
<u>N.</u> <u>volucellus</u> (Mimic shiner)	X	X						
<u>Phoxinus</u> <u>eos</u> (Northern redbelly dace)								
<u>P.</u> <u>neogaeus</u> (Finescale dace)								
<u>Pimephales</u> <u>notatus</u> (Bluntnose minnow)	X	X			X			
<u>P.</u> <u>promelas</u> (Fathead minnow)	X	X						
<u>Rhinichthys</u> <u>atratulus</u> (Blacknose dace)	X				X			
<u>R.</u> <u>cataractae</u> (Longnose dace)	X	X						
<u>Semotilus</u> <u>atromaculatus</u> (Creek chub)	X	X						
<u>S.</u> <u>corporalis</u> (Fallfish)	X	X			X			
<u>S.</u> <u>margarita</u> (Pearl dace)								
GADIDAE (Codfishes)								
<u>Lota</u> <u>lota</u> (Burbot)			X					

BENTHOS

Benthic organisms are important indicators of water quality. However, little study has been done on the benthos of Lake Ontario. What study has been done has concentrated mainly on the Canadian shoreline. Distribution and abundance of macroinvertebrates is influenced primarily by substrates. Currents and wave action in the littoral zone cause a constantly changing population. Studies reviewed indicate that tubificidae and mollusca are the most common groups. According to these reports the only species recorded along all of the Lake Ontario shoreline was *Pisidium*. The most complete records are from Oswego County due to the utilities impact statement in the area.

BENTHIC ORGANISMS IN THE LAKE ONTARIO NEARSHORE ZONE

	Oak Orchard (Orleans Co.)	*Rochester (Irondequot Bay)*	*Nine Mile Point (Oswego Co.)*	*Port Ontario (Oswego Co.)*	*New Haven (Mexico Bay, Oswego Co.)*
PLATYHELMINTHES					
Neorhabdocoela	X				
Tricladid	X				X
Rhabdocoele la					X
NEMATODA	X	X	X		
ANNELIDA					
Hirudinea		X		X	X
Glossiphonia sp.				X	X
OLIGOCHAETA					
Enchytraidae					X
Lumbriculidae				X	
Stylodrilus heringianus	X				
Naididae				X	X
Piquetiella michiganensis			X		
Vejdovskyella intermedia		X			
Tubificidae				X	
Aulodrilus pluriseta		X			X
L mnodrilus hoffmeisteri		X			X
L. udekemianus		X			X
Peloscolex ferox	X	X			
P. freyi					X
P. multisetosus	X	X			X
Potomothrix moldaviensis	X	X	X		
P. vejdovskyi	X	X	X		
Rhyacodrilus coccineus			X		X
Tubifex tubifex					X

	Oak Orchard (Orleans Co.)	Rochester (Irondequot Bay)	Nine Mile Point (Oswego Co.)	Port Ontario (Oswego Co.)	New Haven (Mexico Bay, Oswego Co.)
Unidentifiable Tubificidae					
with capilliform chaetae		X			X
without capilliform chaetae	X	X	X		X
POLYCHAETA					
<u>Manayunkia</u> <u>speciosa</u>	X	X		X	X
ARTHROPODA					X
Arachnoidea					
Hydracarina	X		X	X	
Decapoda				X	X
Astracidae					
Crustacea					
Amphipoda					
<u>Hyalella</u>				X	X
<u>Gammarus</u> sp.			X	X	X
<u>Pontoporeia</u> <u>affinis</u>			X		
Isopoda					
<u>Asellus</u> <u>communis</u>	X	X		X	
Ostracoda		X	X		
INSECTA					
Diptera					
Ceratopogonidae				X	X
Chironomidae				X	X
<u>Chryptochironomus</u> <u>cf.</u> <u>digitatus</u>			X		
<u>C.</u> <u>cf.</u> <u>nais</u>	X				
<u>C.</u> <u>cf.</u> <u>vulneratus</u>	X				
<u>Heterotrissocladius</u>	X				
<u>Micropsecta</u> sp.	X		X		X

	Oak Orchard (Orleans Co.)	*Rochester (Irondequot Bay)*	*Nine Mile Point (Oswego Co.)*	*Port Ontario (Oswego Co.)*	*New Haven (Mexico Bay, Oswego Co.)*
Microtendipes sp.			X		X
Potthastia cf. longimana			X		
Procladius	X	X			
Chironomus sp.				X	
MOLLUSCA					
Gastropoda					
Goniobasis sp.				X	
Amnicola binneyana	X			X	
A. lustrica	X			X	
Amnicola sp.			X	X	X
Gyraulis sp.				X	X
Bulimius tentaculatus	X				
Helisoma sp.				X	X
Lymnaea emarginata		X			X
Physa sp.	X	X		X	
Spirodon sp.				X	
Valvata sincera	X	X	X		
V. tricarinata	X				
Ferrissia sp.				X	
Pelecypoda					
Elliptio sp.				X	
Pisidium sp.	X	X	X	X	X
Sphaerium corneum	X	X		X	
S. (Musculium) lacustre jayense		X			
S. mitidum	X				
S. striatinum	X	X			
S. (M.) transversum	X		X		X

	Oak Orchard (Orleans Co.)	Rochester (Irondequot Bay)	Nine Mile Point (Oswego Co.)	Port Ontario (Oswego Co.)	New Haven (Mexico Bay, Oswego Co.)
Anodondoides				X	
Ligumia sp.				X	
Unionidae sp.				X	
Coleoptera					
Dubiraphia sp.				X	
Stenelmius sp.				X	X
Optioservus sp.				X	X
Ephemoptera					
Tricorythodes				X	
Baetiade				X	
Stenonema				X	X
Hexaginea sp.				X	X
Tubellaria				X	
ODONATA					
Ischnura sp.				X	X
Triacanthagyra sp.				X	
MEGALOPTERA				X	X
LEPIDOPTERA				X	X
CNIDARIA					
Hydridae					
Hydra sp.				X	X
HEMIPTERA					
Gerris sp.					X
Nectonectidae					X
Cymatia sp.					X

ZOOPLANKTON

As with benthic organisms, little study has been done on the zooplankton in the littoral Lake Ontario Zone. Czaika (1974) recorded the abundance of zooplankton in the coastal zone from Port Weller, Ontario to Rochester, New York. However, she did not designate which were more abundant at each station. No information was found for areas between Oswego and the St. Lawrence River or between Rochester and Oswego.

ZOOPLANKTON OF THE LAKE ONTARIO NEARSHORE ZONE

	New Haven	Niagara Co.	Orleans Co.	Rochester, N.Y.	St. Lawrence R.
COPEPODA					
nauplii	X	X	X	X	
calanoid copepodites	X	X	X	X	
cyclopoid copepodites	X	X	X	X	
harpacticoid copepodites	X	X	X	X	
Cyclops bicuspidatus thomasi Forbes	X	X	X	X	X
C. scutifer Sars	X				
C. varicans rubellus Lilljeborg	X				
C. vernalis Fischer	X	X	X	X	
Diaptomus ashlandi Marsh	X	X	X	X	
D. minutus Lilljeborg	X	X	X	X	X
D. oregonensis Lilljeborg	X	X	X	X	
D. pallidus Herrick	X	X	X	X	
D. sicilis Forbes	X	X	X	X	
D. siciloides Lilljeborg	X	X	X	X	
Epischura lacustris Forbes	X				
Eucyclops agilis (Koch)	X	X	X	X	
Eurytemora affinis Poppe	X	X	X	X	
Harpacticoida	X	X	X	X	
Limnocalanus macrurus Sars	X	X	X	X	
Mesocyclops edax (Forbes)	X	X	X	X	X
Tropocyclops prasinus mexicanus Kiefer	X	X	X	X	
Bryocamptus nivalis		X	X	X	
CLADOCERA					
Alona barbulata Megard	X	X	X	X	
A. quadrangularis (O.F. Muller)	X				
Bosmina longirostris (O.F. Muller)	X	X	X	X	X
Ceriodaphnia lacustris Birge	X	X	X	X	X
C. reticulata (Jurine)	X				

	New Haven	Niagara Co.	Orleans Co.	Rochester, N.Y.	St. Lawrence R.
CLADOCERA (Continued)					
Ceriodaphnia spp. (immature form)	X				
Chydorus sphaericus (O.F. Muller)	X	X	X	X	X
Daphnia ambigua Scourfield	X	X	X	X	
D. galeata mendotae Birge	X	X	X	X	X
D. pulicaria Forbes	X				
D. retrocurva Forbes	X	X	X	X	
D. spp. (immature form)	X				
Diaphanosoma leuchtenbergianum Fischer	X	X	X	X	
Eubosmina coregoni (Baird)	X	X	X	X	
Holopedium gibberum Zaddach	X	X	X	X	
Leptodora kindtii (Focke)	X	X	X	X	
Leydigia leydigi (Schoedler)	X				
Pleuroxus spp. Baird	X				
Sida crystallina (O.F. Muller)	X				
Camptocerus rectirostris		X	X	X	
Daphnia longiremis		X	X	X	
Eurycercus lamellatus		X	X	X	
Macrothrix sp.		X	X	X	X
Polyphemus pediculus		X	X	X	
Ascoperus harpae					
ROTIFERA					
Asplanchna spp. Gosse	X				
Bdelloidea	X				X
Brachionus spp. Pallas	X				X
Cephalodella spp. Bory de St. Vincent	X				
Chromogaster spp. Lauterborn	X				
Collotheca spp. Harring	X				
Conochiloides spp. Hlava	X				X

	New Haven	Niagara Co.	Orleans Co.	Rochester, N.Y.	St. Lawrence R.
ROTIFERA (Continued)					
Conochilus spp. Hlava	X				
C. unicornus					X
Euchlanis spp. Ehrenberg	X				
Filina spp. Bory de St. Vincent	X				X
Gastropus spp. Imhoff	X				X
Kellicottia spp. Ahlstrom	X				X
Keratella spp. Bory de St. Vincent	X				X
K. quadrata					X
Lecane spp. Nitzsch	X				
Lepadella spp. Bory de St. Vincent	X				
Monostyla spp. Ehrenberg	X				
Mytilina spp. Bory de St. Vincent	X				
Notholca spp. Gosse	X				X
Ploesoma spp. Herrick	X				X
Polyarthra spp. Ehrenberg	X				
P. vulgaris					X
Synchaeta spp. Ehrenberg	X				
Testudinella spp. Bory de St. Vincent	X				
Trichocerca spp. Lamarck	X				
T. cyclindrica					X
Trichotria spp. Bory de St. Vincent					
PROTOZOA					
Ciliophora	X				
Mastigophora	X				
Sarcodina	X				
Difflugia lebes					X

PHYTOPLANKTON

Algae appears to be the most completely studied plankton in the Lake Ontario Littoral Zone. Records of varying quality exist for nearshore areas from Oak Orchard into the St. Lawrence River. Cladophora, an attached green filamentous algae, is treated separately from other phytoplankton. Cladophora is found in abundance along the coast as it typically exists in water depths of 5-6 m. The oftimes rocky shoreline provided the firm and stable rock substrate that Cladophora needs for attachment.

PHYTOPLANKTON OF THE LAKE ONTARIO NEARSHORE ZONE

	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lake Lawrence
CHLOROPHYTA								
Actinastrum hantzschii					X	X	X	X
Ankistrodesmus falcatus	X	X	X		X	X	X	X
Ankistrodesmus falcatus var.					X	X	X	X
Ankistrodesmus spiralis					X	X	X	X
A. convolutus		X	X		X			
Carteria cordiformus					X	X	X	X
Chlamydomonas sp.				X	X	X	X	X
Coelastrum microporum	X	X	X			X	X	X
Closteriopsis longissima			X		X	X	X	X
Coetastrum reticulatum						X	X	X
Cosmarium botrytis						X		
Cosmarium pyramidatum						X		X
Cosmarium reniforme						X	X	X
Cosmarium sp.	X	X						
Crucigenia rectangularis								X
Crucigenia apicrilata					X			
Crucigenia tetrapedia					X		X	
C. quadrata					X			
Dictyosphaerium pulchellum					X	X	X	X
Elakatothrix gelatinosa						X	X	X
Franceia ovalis					X	X	X	X
Golenkinia paucispina						X	X	
Golenkinia radiata					X	X	X	X
Kirchneriella contorta					X	X	X	X
K. elongata					X			
Kirchneriella lunaris					X			X
Lagerheimia longiseta					X			
Lagerheimia ciliata					X	X	X	X
Micractinum pusillum					X	X	X	X
Micrasterias apiculata								X
Mougeotia sp.					X	X	X	X

	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lake Lawrence
CHLOROPHYTA (Continued)								
<u>Nephrocytium</u> <u>limneticum</u>					X	X	X	X
<u>Oocystis</u> <u>elliptica</u>						X	X	X
<u>Oocystis</u> <u>lacustris</u>						X	X	X
<u>Oocystis</u> sp.	X	X	X	X	X			
<u>Pandorina</u> <u>Morum</u>					X	X	X	X
<u>Pediastrum</u> <u>boryanum</u>						X	X	X
<u>Pediastrum</u> <u>duplex</u>	X	X	X		X	X	X	X
<u>P.</u> <u>intergrum</u>						X		
<u>Pediastrum</u> <u>obtusum</u>						X	X	X
<u>Pediastrum</u> <u>simplex</u>		X	X		X		X	
<u>Closterium</u> spp.					X			
<u>Coelastrum</u> spp.					X			
<u>Dictyosphaerium</u> <u>ehrenbergianum</u>					X			
<u>Eudorina</u> <u>elegans</u>					X			
<u>Echinosphaerella</u> <u>limnetica</u>					X			
<u>Franceia</u> <u>aroescheri</u>					X			
<u>Gloeoactonum</u> <u>limneticum</u>					X			
<u>Gloeocystis</u> <u>planctonica</u>					X			
<u>Gonuim</u> <u>formosum</u>					X			
<u>G.</u> <u>sociale</u>					X			
<u>Kirchneriella</u> <u>obesa</u>					X			
<u>K.</u> <u>subsolitaria</u>					X			
<u>Lagerheimia</u> <u>quadriseta</u>					X			
<u>Mesostigma</u> <u>veridis</u>					X			
<u>Oocystis</u> <u>borgei</u>					X			
<u>O.</u> <u>pusilla</u>					X			
<u>Scenedesmus</u> <u>acutiformis</u>					X			
<u>S.</u> <u>arcuatus</u>					X			
<u>S.</u> <u>bicellularis</u>					X			
<u>Selenastrum</u> <u>minutum</u>					X			
<u>Sphaerellopsis</u> <u>fluvelatilis</u>					X			

	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lake Lawrence
CHLOROPHYTA (Continued)								
Staurastrum cuspidatum					X			
S. megacanthum					X			
S. paradoxum					X			
S. tetracerum					X			
Tetraedron muticum					X			
T. regulare					X			
Tetrastrum heteracanthum					X			
T. Staurogeniaeforme					X			
Spirogyra					X			
Pediastrum tetras					X		X	X
Scendesmus abundans					X			
Scenedesmus armatus var.					X			X
S. acuminatus					X	X	X	X
Scenedesmus bijuga	X	X	X		X			
Scenedesmus bijuga var. *alterans*							X	
S. longus					X			
Scenedesmus denticulatus					X	X	X	X
Scenedesmus dimorphus					X	X	X	X
Scenedesmus opoliensis					X		X	
Scenedesmus quadricauda	X		X		X	X	X	X
S. setiratus					X			
Schroederia setigera					X	X	X	X
S. Judayi		X						
Sphaerocystis schroeteri	X		X		X	X	X	X
Staurastrum gracile						X	X	X
Staurastrum natator						X	X	X
Staurastrum sp.		X	X		X			
Stylosphaerium stipitatum								X
Tetraedron caudatum					X			X
Tetraedron minimum	X		X		X	X	X	X
Treubaria setigerum						X		

	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lake Lawrence
CHLOROPHYTA (Continued)								
Quadirgula chodatii				X				
Q. lacustris				X				
Ulothrix sp.				X				
U. subtillissima				X				
Uronema				X				
EUGLENOPHYTA								
Euglena sp.	X		X		X		X	
Phacus acuminatus					X			X
PYRROPHYTA								
Ceratium hirundinella			X		X	X	X	X
Glenodinium quadridens					X	X	X	X
Gymnodinium palustre					X	X	X	
Peridinium sp.			X		X			
CRYPTOPHYTA								
Cryptomonas obovata					X			
Cryptomonas ovata					X	X	X	X
Cryptomonas pusilla					X	X	X	X
C. curvata					X			
C. erosa					X			
C. matssonii					X			
C. reflexa					X			
C. splendica					X			
Cryptomonas sp.					X			
Rhodomonas minuta					X			
CHRYSOPHYTA-CHRYSOPHYCEAE								
Chromulina elegans					X			
Chromulina minuta						X	X	X
Chromulina					X		X	X
Chrysamoeba radians						X	X	X
Dinobryon acuminatum							X	X

	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lake Lawrence
CHRYSOPHYTA-CHRYSOPHYCEAE (Continued)								
Dinobryon bavaricum						X	X	X
Dinobryon divergens					X	X		
Dinobryon sertularia					X	X	X	X
Mallomonas akrokomos					X	X	X	
Ochromonos sp.					X	X	X	X
Synura uvella					X	X	X	X
Uroglenopis americana						X	X	X
Chrysochromulina parva					X			
Diceras phaseolus					X			
Dinobyron sociale					X			
Dinobyron sp.					X			
Rhizochrysis spp.					X			
CHRYSOPHYTA-BACILLARIOPHYCEAE								
Asterionella formosa				X	X	X	X	X
Asterionella gracillima						X		X
Cocconeis placentula						X	X	X
Cyclotella				X	X	X	X	X
Coclotella michigianian				X	X	X	X	X
Cymbella ventricosa						X	X	X
Diatoma tenue var. elongatum					X	X	X	X
Fragilaria crotonensis				X	X	X	X	X
Fragilaria virescens					X	X	X	X
Gyrosigma fasicola								X
Melosira granulata							X	X
Melosira islandica						X	X	X
Melosira varians C.						X	X	X
Meridon ambigua					X	X		
Meridon circulare				X	X		X	X
Navicula minima					X			X
Rhiocosphenia curvata					X	X	X	X
Stephanodiscus tenius				X	X	X		X

CHRYSOPHYTA-BACILLARIOPHYCEAE (Continued)	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lak Lawrence
Synedra acus				X		X	X	X
Synedra cyclopum				X	X		X	X
Synedra rumpens				X			X	X
Synedra ulna				X	X	X	X	X
Tabellaria fenestrata				X	X	X	X	X
Coscinodiscus rothii					X			
Melosira distans					X			
M. granulata					X			
M. islandica					X			
Rhizosolenia longiseta					X			
Skeletonena potamas					X			
Shephanodiscus alpinus					X			
S. astraea					X			
Surirella spp.					X			
Synedra spp.					X			
Nitzschia spp.					X			
Stephanodiscus binderanus					X			
S. hantrschii					X			
S. niagarae					X			
Shephanodiscus sp.					X			
Stephanodiscus spp.					X			
Cocconeis pediculus					X			
Cymbella spp.					X			
Diatoma vulgare					X			
D. Vulgare V. ovalis					X			
Entomoneis ornata					X			
Fragilaria capucina					X			
F. vaucheria					X			
Gomphonema					X			
G. olivaceus					X			
Gomphonema spp.					X			

	Oak Orchard Orleans County	Rochester New York	Nine Mile Point Oswego County	Wayne County Little Sodus Bay	New Haven Oswego County	Cape Vincent	Chippewa Bay	Lake Lawrence
CHRYSOPHYTA-BACILLARIOPHYCEAE (Continued)								
Gyrosigma exilus					X			
Naircula tripunctata					X			
CYANOPHYTA								
Anabaena flos-aquae		X	X			X	X	X
Aphanothece nedulans					X			
Aphanizomenon flos-aquae	X	X	X			X	X	X
Coelosphaerium kuetzingianum		X				X	X	
C. collinsii					X			
Chroococcus dispersus					X	X	X	X
Gomphosphaeria aponima					X			
Gomphosphaeria lacustris					X		X	X
Lyngbya limnetica						X	X	X
Merismopedia trolleri								X
Microcystis aeruginosa					X	X	X	X
Oscillatoria prolifica						X		X
Phormidium tenue						X		X
Spirulina subsalsa								X
Stichosiphon regularis						X	X	
Aphanocapsa elacrista					X			
Aphanocapsa spp.					X			
Aphanotheca spp.					X			
Aphanotheca saxicola					X			
Coelosphaeruim naegellanum					X			
Dactytococcopsis rhaphidiodes					X			
Merismopedia glauca					X			
M. tenuissima					X			

Extracted from New Haven Environmental Impact Statement

NEW YORK STATE ELECTRIC & GAS

SPECIES LIST OF PERIPHYTON COLLECTED FROM ARTIFICIAL SUBSTRATES IN LAKE ONTARIO, MAY THROUGH DECEMBER 1977

[illegible]

VEGETATION

Records of types of vegetation are most complete for Oswego County and the St. Lawrence River area. The St. Lawrence - Eastern Ontario Commission has classified vegetation types, but not species or common names. Records for Orleans and Niagara Counties are few since 1934. Forest areas in Monroe County are listed, but species are not indicated. From the literature, however, it is evident that the Lake Ontario shoreline still boasts many undeveloped areas which support a variety of plant species.

Some general information on the nature and extent of shore zone vegetation in the Lake Ontario and St. Lawrence River area can be secured through an examination of the reconnaissance photographs made by Cornell University of the counties throughout New York State relative to land use patterns. Some regional planning agencies also have contracted for photographic surveys of the areas for which they are responsible.

Remote sensing information of the coastal zone also is available through satellite imagery from LANDSTAT and other National Aeronautical and Space Administration (NASA) devices. The NASA facility in Cleveland, Ohio, also has made photographs from fixed wing craft in selected regions of the Great Lakes Basin including Ontario. Likewise CALSPAN, formerly Cornell Aeronautical Laboratory Inc. also has shoreline photographs, many of which were made during the International Field Year on the Great Lakes (IFYGL), a joint Canadian - U.S. physical, chemical and biological study that focused on Lake Ontario.

The variety of shoreline topography along the shore of Lake Ontario contains diverse types of vegetation. These areas are breeding and habitat areas for many birds, mammals, amphibians, reptiles, and fish. There are several areas along the shoreline which are important because of the types of rare plants found there. (See the following table for specifics.)

I. MONROE COUNTY

A. Braddock Bay State Park is located in Greece, New York. The park consists of extensive marshes which serve as wildlife habitat and scrubwoods. The park includes the Cranberry Pond Nature Trail, which runs 2½ miles through brush and woodlands. It boasts 35 varieties of trees and shrubs and 60 varieties of wild plants.[22]

B. Monroe County has several forests along the coastal zone. Among these are: from Troutburg to Devil's Nose; Hamlin Beach State Park, the south edge of Cranberry Pond; Long Pond; Post Avenue in Greece, New York; edge of Round Pond; Durand Eastman Park in Rochester; Irondequoit Bay; east of Oklahoma Beach, Webster, New York; and Webster Beach County Park.

II. OSWEGO COUNTY

A. The dune area of Deer Creek Marsh contains oak and pine cover, as well as shrubby thickets made up of willow, alder, and dogwood.

B. Selkirk Shores State Park, north of Deer Creek Marsh, is the scene of a hardwood forest. Species included in this park are

red oak, ash, sugar maple, beech, cherry trees, white pine and hemlock.

III. SAINT LAWRENCE - EASTERN ONTARIO REGION (JEFFERSON COUNTY)

A. Dense red oak is found in the forested area of Jacques Cartier State Park. Abundant ground cover is found in the limestone out croppings. The canopy provides a shade area for well developed growth of forest floor herbs. The large variety and size of species make this an important area.[13]

B. The area of Crooked Creek, the north edge of Goose Bay, and the south edge of Chippeway Bay is a unique area because of the habitat diversity. Undeveloped forests occur on rock outcropping, and wetlands, whose main vegetation is cattail, occur throughout this area.[13]

C. Unique size and composition stability of the deciduous forest on Wellesley Island near the Thousand Islands County Club make this area an important wildlife area. The nearness of the country club makes the area prime for residential use and endangers its continuation.[13]

D. Graminoid Marsh at Keewaydin State Park is the best graminoid wetland in the area.[13]

E. Oak and hemlock trees are found in a mixed forest west of Alexandria Bay. Coral root has been found there as well as old and new vegetative species.[13]

F. A 2 acre forest is located at the end of St. Lawrence Park Road overlooking Swan Bay. Species found there include red oak, basswood, maple, trillium, may apple, meadow rue, and false Soloman's seal.[13]

G. Wilson Bay Marsh is a scrubby marsh and forest area south of Cape Vincent. Species found there are buttonbush, willow, dogwood and black ash. Ash, elm and silver maple are abundant in the marsh.[13]

H. An area of shrubby marsh is located on Point Peninsula on the shore of Lake Ontario. Dune species, such as wormwood, grasses, and evening primrose occur along the beach. The marsh beyond the beach gradually grades into a forest. Vegetation in this area is considered very fragile.[13]

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LAKE ONTARIO SHORE PROTECTION STUDY: LITERATURE REVIEW REPORT.(U)
JUL 79 R SWEENEY, T WOLFE, L TINGUE DACW49-79-C-0026

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VEGETATION OF THE LAKE ONTARIO NEARSHORE ZONE

	New Haven (Oswegao Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans co.	Niagara Co.
POLYPODIACEAE					
Onoclea sensibilis (Sensitive Fern)	X	X	X		
Adiantum pedalum (Maidenhair Fern)		X			
Athyrium filix-foemina (Lady Fern)		X			
Polystichum acrostichoides (Christmas Fern)		X			
Thelypteris noveboracensis (New York Fern)		X			
Dryopteris cristata (Crested Wood Fern)			X		
Pteretis pennsylvanica (Ostrich Fern)			X		
Dryopteris thelypteris (Marsh Fern)			X		
TYPHACEAE					
Typha sp. (Cattail)	X	X			
Typha angustifolia (Narrow-leaved Cattail)		X	X	X	
T. latifolia (Broad-leaved Cattail)		X	X		
T. glauca (Glaucous Cattail)			X		
SPARGANIACEAE					
Sparganium eurycarpum (Giant Bur Reed)	X	X	X		
Sparganium sp. (Floating leaf Bur-reed)		X	X		
S. americanum (Bur-reed)			X		
S. androcladum (Bur-reed)			X		
S. chlorocarpum (Bur-reed)			X		
POTAMOGETONACEAE					
Potamogeton crispus (Curly Pondweed)	X	X	X	X	
P. epihydrus (Leafy Pondweed)	X	X	X	X	
P. Richardsonii (Clasping-leaf Pondweed)	X	X	X	X	
Potamogeton sp. (Flat-stemmed Pondweed)	X		X	X	
Potamogeton sp. (Large-leafed Pondweed)	X			X	
Potamogeton sp. (Leafy Pondweed)	X		X	X	
P. amplifolius (Large-leaved Pondweed)			X	X	

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
POTAMOGETONACEAE (con't.)					
Potamogeton natens (Swimming Pondweed)			X	X	
P. pectinatus (Sago Pondweed)			X	X	
P. pusillus (Small Pondweed)			X	X	
P. robbinsii (Robbin's Pondweed)			X		
NAJACACEAE					
Najas flexilis (Flexible Naiad)	X	X	X		
ALISMATACEAE					
Alisma plantago-aquatica (Water Plantain)	X	X			
Sagittaria latifolia (Wapato, Duck Potato)	X	X	X		
S. frigida (Bur Arrowhead)	X	X	X	X	
S. cuneata (Arum-leaved Arrowhead)		X	X	X	
A. gramineum (Water Plantain)			X		
A. triviale (Water Plantain)			X		
HYDROCHARITACEAE					
Elodea canadensis (Waterweed, Eelgrass)	X	X	X		
Vallioneria americana (Wild Celery)	X	X	X		
Hydrocharis morsus-ranae L. (European frog bit)			X		
GRAMINEAE					
Echinochloa Walteri (Wild Millet)	X				
Glyceria borealis (Manna grass)	X		X		
G. grandis (Manna grass)	X		X		
Ammophila arenona (Beach grass)		X			
Calamagrostis canadensis (Blue joint)			X		
Echinochloa crusgalli (Barnyard grass)			X		
E. pungens (Barnyard grass)			X		
Glyceria striata (Manna grass)			X		
Lecrsia oryzoides (Rice Cutgrass)			X		
Phalaris arundinaceae (Reed Celery grass)			X		
Phragmites communis (Giant Reed grass)			X		
Poa compressa (Canada bluegrass)			X		
Zizania aquatica (Wild Rice)			X		

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
GRAMINEAE (con't.)					
Bremus inermis (Hungarian Broom grass)				X	X
Cinna arundinaceae (Wood Reed)					X
LEMNACEAE					
Lemna sp. (Duckweed)	X	X	X		
L. trisulca (Star Duckweed)			X		X
Spirodela polyrhiza (Giant Duckweed)	X		X		
Wolffia punctata (Water Meal)			X		
W. columbiana (Water Meal)					X
PONTEDERIACEAE					
Pontederia cordata L. (Pickerel Weed)	X	X	X		
Heteranthera dubia (Water Stargrass)		X	X		
JUNCAEAE					
Juncus nodosus (Rush)			X		
J. torreyi (Rush)	X		X	X	
J. balticus (Creeping Rush)			X		
J. articulatus (Rush)			X		
J. effusus (Soft Rush)			X		
J. filiformis (Rush)			X		
POLYGONACEAE					
Polygonum sagittatum (Arrow-leaved Tearthumb)			X		
P. natans (Water Smartweed)	X		X		
P. punctatum (Dotted Smartweed)	X		X		
P. caespitosum (Smartweed)		X	X		
P. coccineum (Swamp Smartweed)		X	X	X	X
P. hydropiper (Common Smartweed)		X	X		
Rumex acetosella (Sheep sorrel)		X			
R. crispus (Curlydock)		X			
R. martinius (Golden dock)			X		
R. obtusifolius (Broad-leaved dock)		X			
R. verticillatus (Swamp dock)					X
Polygonum hydropperoides			X		

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
CERATOPHYLLACEAE					
Ceratophyllum demersum (Coontail)	X	X	X		
NYMPHAECEAE					
Nuphar rubrodiscum (Yellow Water Lily)	X	X			
Nymphaea tuberosa (White Water Lily)	X		X		
Nymphaea ordorata (Sweet-scented Water Lily)		X			
Nuphar microphyllum (Yellow Pond Lily)			X	X	
N. verigatum (Yellow Pond Lily)			X	X	
CRUCIFERA					
Nasturtium officinede (Water Cress)	X				
HYPERICACEAE					
Hypericum mutilum (Dwarf St. Johnswort)	X				
H. perforatum (Common St. Johnswort)		X			
GUTTIFERAE					
Hypericum punctatum (Spotted St. Johnswort)			X		
ONAGRACEAE					
Epilobium coloratum (Purple-leaved Willow Herb)	X				
E. hirsutum (Coreat Hairy Willow Herb)		X			
Circaea quadrisculcata (Enchanter's Night)		X			
Oenothera biennis (Evening Primrose)		X			
HALORAGIDACEAE					
Myriophyllum (Watermillfoil)	X	X	X		
VERBENACEAE					
Verbena simplex (Narrow-leaved Vervain)	X				
V. hastata (Blue Vervain)		X	X	X	
POLEMONIACEAE					
Phlox divaricata (Blue Phlox)		X			
SCROPHULARIACEAE					
Mimulus ringens (Square-stemmed Monkey Flower)	X				

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
COMPOSITAE					
Eupatorium perfoliatum (Boneset Thoroughwort)	X				
Artemisia biennis (Brennial Wormwood)					X
Aster ericoides (White heat-asher)				X	X
Centaurea dubia (Suter)					X
CABDOMBACEAE					
Brasenia schrebesi (Water Shield)		X			
LYCOPODIACEAE					
Lycopodium clavatum (Running Clubmoss)		X			
L. obscurum (Ground Pine)		X			
L. tristachyum (Ground Cedar		X			
SELAGINELLACEAE					
Selaginella apoda (Creeping Spikemoss)		X			
EQUISETACEAE					
Equisetum arvense (Common Horsetail)		X			
E. fluviatile (Swamp Horsetail)		X	X		
E. hyemle (Scouring Rush)		X			
E. sylvaticum (Wood Horsetail)		X			
OSMUNDACEAE					
Osmunda cinnamomea (Cinnamon Fern)		X	X		
O. regalis (Royal Fern)		X	X		
TAXACEAE					
Taxus baccata (Ground Hemlock)		X			

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
PINACEAE					
Abies balsamea (Balsam Fir)		X			
Larix laricina (Tamarack)		X	X		
Picea mariana (Black Spruce)		X			
Tsuga canadensis (Canada Hemlock)		X		X	
Pinus strobus (White Pine)		X		X	
Juniperus communis (Common Junipar)		X			
Thuja occidentalis (White Cedar)		X	X		
ARACEAE					
Arisaema triphyllum (Jack-in-the-Pulpit)		X			X
Calla palustiis (Wild Calla)		X			
Peltandra virginica (Arrow-arum)		X	X		
Acorus calamus (Sweet Flag)			X		
LILIACEAE					
Allium tricoccum (Wild Leek)		X			
Clintonia borealis (Yellow Clintonia)		X			
Convallaria majalis (Lily-of-the-Valley)		X			
Hemerocallis fulva (Day Lily)		X			
Lilium canadense (Canada Lily)		X			
Mededa virginiana (Indian Cucumber Root)		X			
Polygonatam biflorum (Solomon's Seal)		X			
Smilacina racemosa (False Solomon's Seal)		X			
Smilacina stellara (Star Flowered Solomon's Seal)		X			
Smilax rotundifolia (Common Greenbriar)		X			
Trillium erectium (Red Trillium)		X			
T. grandiflorum (White Trillium)		X			
T. undulatum (Pointed Trillium)		X			
Veratrum viride (False Hellebore)		X			
Smilax herbacea (Green Briar)			X		

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
IRIDACEAE					
Iris pseudacorus (Yellow Iris)		X	X		
I. versicolor (Large Blue Flag)		X	X		
SAURURACEAE					
Saururus ceinuus (Lizard's Tail)			X	X	
ORCHIDACEAE					
Cypripedium reginae (Showy Lady Slipper)		X			
Epipactis helleborine (Weed Orchid)		X	X		
Habenaria clavellata (Green Woodland Orchid)		X			
Malaxis monophylla (White Adder's Mouth)		X			
Spiranthos cernua (Nodding Ladies Tresses)		X			
Corallorhiza maculata (Spotted Coral Root)			X		
Cypripedium acaule (Stemless Lady's Slipper)			X		
SALICACEAE					
Populus deltoides (Cottonwood)		X	X		
P. grandidentata (Large-tooth Aspen)		X			
P. tremuloides (Trembling Aspen)		X			
Salix alba (White Willow)		X	X		
S. discolor (Pussy Willow)		X	X		
S. nigra (Black Willow)		X	X		
S. purpurca (Basket Willow)		X	X		
S. rigida (Cordate Heart-leafed Willow)		X			
S. sericea (Silty Willow)		X			
S. syriticola (Heart-leafed Willow)		X			
S. bilfiana (Long-beaked Willow)			X		
S. fragilis (Crack Willow)			X		
S. gracilis (Slender Willow)			X		
S. lucida (Shining Willow)			X		

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
JUGLANDACEAE					
<u>Carya glabra</u> (pignut)		X			
<u>C. ovata</u> (Shagbark Hickory)		X			
<u>Juglans nigra</u> (Black Walnut)		X			
BETULACEAE					
<u>Alunus glutinosa</u> (Black Alder)					X
<u>Alnus incana</u> (Speckled Alder)		X			
<u>Betula aleghenienses</u> (Yellow Birch)		X			
<u>B. papyrifera</u> (Paper Birch)		X			
<u>Carpinus caroliniana</u> (Ironwood)		X			
<u>Corylus cornuta</u> (Beaked Hazelnut)		X			
<u>Ostrya virginiana</u> (Eastern Hophornbeam)		X			
FAGACEAE					
<u>Castanea dentata</u> (Am. Chestnut)		X			
<u>Fagus grandiofolia</u> (Am. Beech)		X		X	
<u>Quercus bicolor</u> (Swamp White Oak)		X		X	
<u>Q. rubra</u> (Red Oak)		X		X	
<u>Q. velutina</u> (Black Oak)		X		X	
<u>Q. macrocarpa</u>					
ULMACEAE					
<u>Ulmus americana</u> (Am. Elm)		X	X	X	
<u>U. rubra</u> (Slippery Elm)		X			
URTICACEAE					
<u>Boehmeria cylindrica</u> (False Nettle)		X	X		
<u>Urtica dioica</u> (Stinging Nettle)		X	X		
<u>Laportea canadenses</u> (Wood Nettle)			X		
ARISTOLOCHIACEAE					
<u>Asarum canadense</u> (Wild Ginger)		X			

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
CHENOPODIACEAE					
Cheropodium album (Lamb's Quarters)		X			
PHYTOLACCACEAE					
Phytolacca americana (Pokeweed)		X			
PORTULACCACEAE					
Claytonia virginica (Narrow Leaved Spring Beauty)		X			
Claytonia caroliniana (Spring Beauty)			X		
CARYOPHYLLACEAE					
Arcnaria lateriflora(Sandwort)		X			
Dianthus armeria (Deptford Pink)		X			
Silene cucubalus (Bladder Campion)		X			
Stellaria graminea (Common Stictchwort)		X			
RANUNCULACEAE					
Actaea alba (Doll's Eyes)		X			
A. rubra (Red Baneberry)		X			
Aquilegia canadensis (Wild Columbine)		X			
Coptis trifolia (Gold Thread)		X			
Hepatica acutiloba (Sharplobed Hepatica)		X			
Ranunculus acris (Tall Field Buttercup)		X			
R. pensylvanicus (Bristly Crowfoot)		X			
R. sceleratus (Cursed Crowfoot)		X	X		
Thalictrum dioicum (Early Meadow Rue)		X			
T. polygamum (Tall Meadow Rue)		X			
Caltha palustris (Marsh Marigold)		.	X		
Ranunculus trichophyllus (Water Crowfoot)			X		
R. repens (Creeping Buttercup)			X		
R. septentrionalis (Swamp Buttercup)			X		

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
BERBERIDACEAE					
Caulophyllum thalictroides (Blue Cohosh)		X			
Podophyllum peltatum (May Apple)		X			
LAURACEAE					
Lindera benzoin (Spice Brush)		X			
Sassafras albidum (Sassafras)		X			
CRUCIFERAE					
Hesperis matronalis (Dame's Rocket)		X			
Lepidium campestre (Donony Pepper Grass)		X			
Cakile edentulata (Sea Rocket)		X			
Rorippa islandica (Marsh Yellow Cress)		X			
Cardamine bulbosa			X		
C. pensylvanica (Bitter Cress			X		
Nasturtium officinala (Water Cress)			X		
CHARACEAE					
Nitella sp. (Stonywort)		X			
Chara vulgaris (Stonewort)			X		
BUTOMACEAE					
Butomus umbellatus (Flowering Rush)			X		
CORYLACEAE					
Alnus rugosa (Speckled Alder)			X		
DROSERACEAE					
Drosera rotundifolia (Sundew)			X		
SAXIFRACEAE					
Penthorum sedoides (Ditch Stonecrop)			X		
Ribes lacustre (Swamp Black Currant)					X

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
ROSACEAE					
Portentula anserina (Silverweed)		X			
Potertilla palustris(Marsh Cirquefoil)			X		
Pyrus melanocarpa (Block Chokeberry)			X		
Rosa polutris(Marsh Rose)		X	X		
Spiraea alba (meadow Sweet)			X		
S. latifolia (Meadow Sweet)			X		
S. tomentosa (Hardback)			X		
Amelanchier arborea (Shadbush)		X			
Fragaria vesca (Wood Strawberry)		X			
F. virginiana (Field Strawberry)		X			
Prunus avium (mazzard)		X			
P. pensylvanica (Pin Cherry)		X			
P. virginiana (Common Choce Cherry)		X			
P. serotina (Black Cherry)		X			
Pyrus aucuparia (European Mountain Ash)		X			
P. communis (Pear)		X			
P. malus (Apple)		X			
Rosa carolina (Postone Rose)		X			
Rubus flagellaris (Dewberry)		X			
R. odcratus (Purple flowering Raspberry)		X			
Crataegus monogyne (English Hewthorne)				X	
OXALIDACEAE					
Oxalis europaea (European Wood Sorrel)			X		
O. montana (Pink Wood Sorrel)		X			
ANACARDIACEAE					
Rhus radicans (Poison Ivy)		X	X		
R. toxicodendron (Poison Oak)		X			
R. typhina (Staghorn Sumac)		X			

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
AQIFOLIACEAE					
Idex verticullata (Winterberry)			X		
Nemepanthus mucronata (Mountain Holly)			X		
ACERACEAE					
Acer rubrum (Red Maple)		X	X		
Acer saccharinum (Silver Maple)		X	X	X	
Acer nigrum (Sugar Maple)		X			
A. pensylvanicul (Striped Maple)		X			
A. spicatum (Mountain Maple)		X			
BALSAMINACEAE					
Impatiens capensis (Spotted Jewelwood)			X		
VITACEAE					
Parthenocissus quinquefolia (Virginia Creeper)		X			
Vitis labrusca (Fox Grapes)		X			
V. aestivalis (Summer Grape)		X			
MALVACEAE					
Hibiscus palustris (Marsh Mallow)			X		
H. moscheutos (Rose Mallow)		X			
Malva moschata (Musk Mallow)		X			
Abutilon theophrastii (Velvet Leaf)				X	
LYTHRACEAE					
Decodon verticillatus (Water Willow)			X		
Lythrum salicaria (Purple Loosestripe)		X	X		
ONAGRACEAE					
Circaea quadrisulcata (Enchanteris Night Shade)			X		
Epilobium coloratum (Willow Herb)			X		
E. hirsutum (Willow Herb)			X		
Ludwigia palustris (Water Purslane)			X		

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
UMBELLIFERACEAE					
Cicuta bulbifera (Water Hemlock)			X		
Cicuta maculata (Spotted Cowbane)			X		
Sium suave (Water Parsnip)			X		
Zizia aurea (Golden Alexanders)			X		
Daucus carota (Wild Carrot)		X			
CORNEACEAE					
Cornus amomum (Silk Dogwood)		X	X	X	
C. racemosa (Panicled Dogwood)			X		
C. stolonifera (Red Osier)			X		
C. alba (Red Osier Dogwood)		X			
C. alternifolia (Alternate-leaf Dogwood)		X			
Nyssa sylvatica (Sour-gum)		X			
ERICACEAE					
Vaccinium (High Bush Blueberry)		X	X		
V. macrocarpon (Large Cranberry)		X			
Andromeda polifolia (Bog Rosemary)		X			
Chamaedaphne calyculata (Leatherleaf)		X			
Epigaea repens (Training Arbutus)		X			
Gaultheria procumbens (Aromatic Wintergreen)		X			
Pyrola elliptica (Shinleaf)		X			
P. rotundifolia (Round leaf Shinleaf)		X			
PRIMULACEAE					
Lysimachia ciliata (Loosestrife)		X	X		
L. quadrifolia (Whorled Loosestrife)			X		
L. terrestria (Swamp Candles)		X	X		
L. thyrsiflora (Tufted Loosestrife)			X		
L. nummularia (Moneywort)		X			
OLEACEAE					
Fraxinus americana (White Ash)		X	X		
F. nigra (Black Ash)			X		
F. pennsylvanica (Red Ash)		X	X		

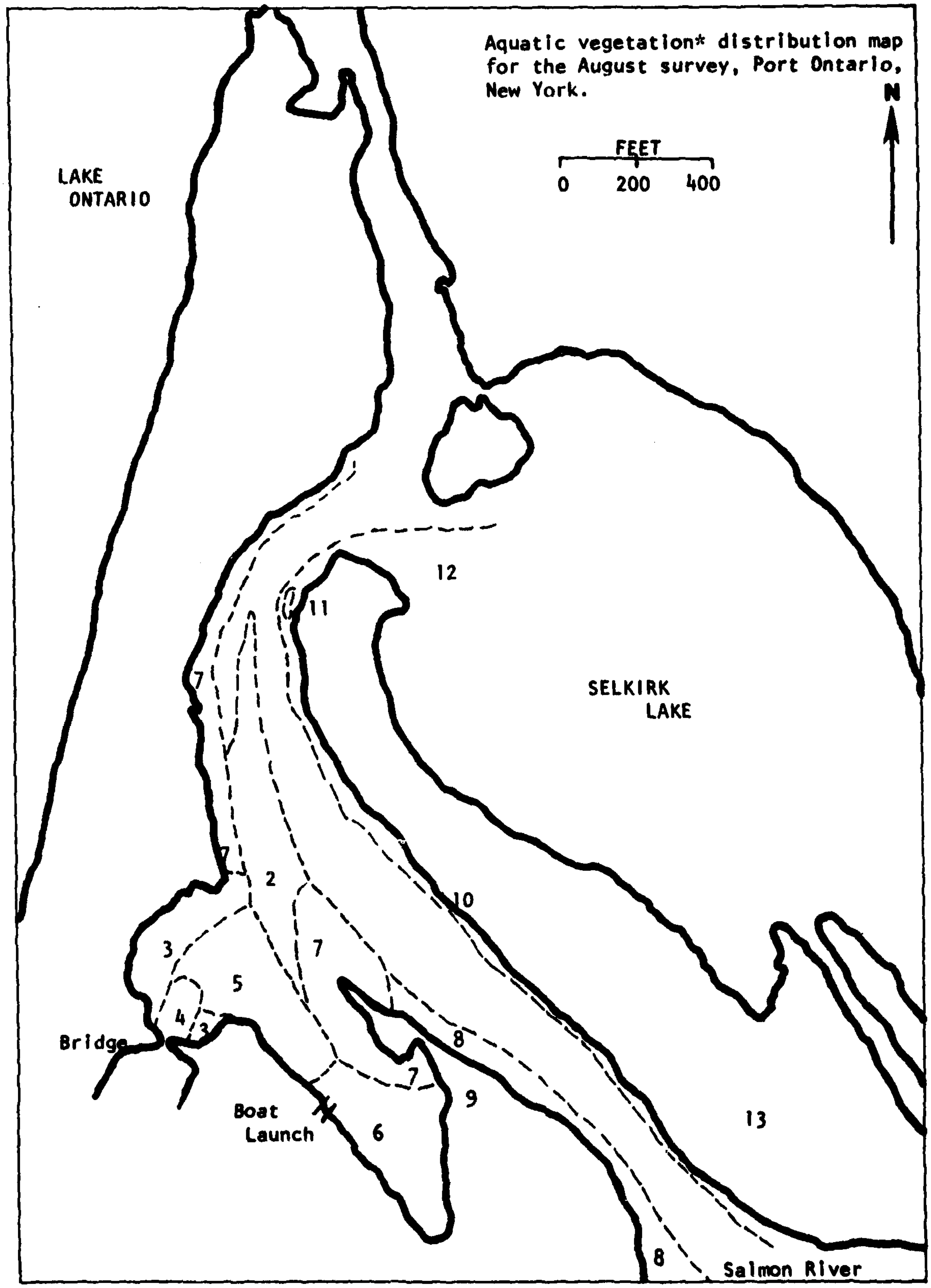
	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
GENTIANACEAE					
Gentiana andrewsii (Closed Gentian)			X		
G. crinita (Fringed Gentian)		X			
ASCELEPIADACEAE					
Asclepias incarnata (Swamp Milkweed)		X	X		
A. syriaca (Common Milkweed)		X			
HYDROPHYLLACEAE					
Hydrophyllum virginianum (Water leaf)			X		
LIBIATAE					
Lycopus americanus (Bugelweed)		X	X		
L. uniflorus (Bugelweed)			X		
Mentha aruensis (Horseweed, Field Mint)		X	X		
M. spicata (Spearmint)		X			
Scutellaria epilobiifolia (Skullcap)			X		
S. laterifolia (Skullcap)			X		
Stachys tenuiflora(Hedge Nettle)			X		
Glecoma hederaceae (Gill-over-the-Ground)		X			
Hedeoma pulegioides (American Pennyroyal)		X			
Leonurus cardiaca (Motherwort)		X			
Prunella vulgaris (Heal-all)		X			
SOLANACEAE					
Solanum carolinense (Horse Nettle)		X			
S. dulcamara (Deadly Nightshade)		X			
SCROPHULARIACEAE					
Chelone glabra (Turtlehead)		X	X		
Gratiola neglecta (Hedge Hyssop)			X		
Mimulus ringens (Monkey Flower)			X		
Linaria vulgaris (Butter and Eggs)		X			
Melamgyrum lineare (Cow Wheat)		X			
Verbascum blattaris (Moth Mullein)		X			
V. thapsus (Common Mullein)		X			

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
LENTIBULARIACEAE					
Utricularia vulgaris (Bladderwort)		X	X	X	
RUBIACEAE					
Cephalanthus occidentalis (Button Bush)		X	X	X	
Galium asprellum (Rough Bedstraw)		X			
Mitchella repens (Partridge Berry)		X			
Houstonia caerulea					X
CAPRIFOLIACEAE					
Samburus canadensis (Elderberry)		X	X		
S. racemosa (Red-Berried Elder)		X			
Viburnum acerifolium (Maple-leaved)		X			
V. cassinoides (Wild Raisin)			X		
V. alnifolium (Hobblebush)		X			
V. lentago (Nannyberry)		X			
V. recognitum (Arrow-wood)		X			
Diervoilla lonicera (Bush Honeysuckle)		X			
Lonicera canadensis (Fly Honeysuckle)		X			
L. morrowi (Morrow's Honeysuckle)		X			
CAMPANULACEAE					
Campanula aparinoides (Marsh Bellflower)			X		
C. rotundifolia (Horsebell)			X		
LOBELIACEAE					
Lobelia cardinalis (Cardinal Flower)		X	X	X	
L. kalmii (Lobelia)			X		
COMPOSITAE					
Bidens cernua (Stick-tight)			X		
B. laevis (Bur Marigold)			X		
Eupatorium maculatum (Joe-Pye-Weed)		X	X		
E. perfoliatum (Throughwort)		X	X		
E. rugosum (White Snakeroot)		X			
E. purpureum (Joe-Pye-Weed)		X	X		
Achillea millefolium (Common Yarrow)		X			
Ambrosia artemsiifolis (Common Ragweed)		X			

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
COMPOSITAE (con't.)					
Anaphalis margaritaceae (Pearly Everlasting)		X			
Artium minus (Common Burdock)		X			
Artemisia stelleriana (Beach Wormwood)		X			
Aster macrophyllus (Large-leaved Aster)		X			
A. novae-angleae (New England Aster)		X			
Bidens frondosa (Beggar's ticks)		X			
Chrysanthemum leucanthemum (White Daisy)		X			
Cichorium intybus (Chicory)		X			
Cirsium vulgare (Bull Thistle)		X			
Coreopsis lanceolata (Lance-leaved Tickseed)		X			
Hieracium aurantiacum (Devil's Paint Brush)		X			
Lactuca serriola (Prickly Lettuce)		X			
Prenanthes alba (Lion's Foot)		X			
Rudbeckia hirta (Black-eyed Susan)		X			
Solidago caesia (Woodland Goldenrod)		X			
S. canadensis (Canadian Goldenrod)		X			
Sonchus deraceus (Common Sow Thistle)		X			
Tanacetum vulgare (Tansy)		X			
Aster ericoides (White Heath Aster)				X	X
Leantodon autumnalis (Fall Dandelion)				X	
CYPERACEAE					
Cyperus strigosus (Lean Sedge)	X		X		
Eleocharis sp. (Spike Rush)	X		X	X	
Scirpus validus Vah. (Soft-stem Bullrush)	X		X		
Carex bebbi (Sedge)			X		
C. crinata (Sedge)			X		
C. granularis (Sedge)			X		
C. lacustris (Sedge)			X		
C. lupulina (Sedge)			X		
C. pedunculata (Sedge)			X		
C. scabrata (Sedge)			X	X	
C. stricta (Tussock Sedge)			X	X	
C. tribuloidea (Sedge)			X	X	
C. vulpinoidea (Sedge)			X		
Cyperus diandrics (Umbrella Sedge)				X	

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
CYPERACEAE (con't.)					
Cyperus engelmanni (Umbrella Sedge)			X		
Scirpus acutus (Hard-stem Bulrush)			X		
S. atrovirens (Bulrush)			X		
S. americanus (Bulrush)			X		
S. cyperinus (Common Woolgrass)				X	
HEPATICAE					
Riccia natans (Liverworts)				X	
CUCURBITACEAE					
Echinocystis lobata (Wild Cucumber)		X		X	
FABACEAE (LEGUMINOSAE)					
Desmodium glutinosum (Tick Trefoil)		X			
Lathyrus maritimus (Beach Pea)		X			
Lotus corinculatus (Birdsfoot Trefoil)		X			
Robina pseudo-acacia (Black Locust)		X			
Vicia cracca (Cow Vetch)		X			
Amphicarpa bracheata (Hog peanut)			X		
Lathyrus paluotris (Marsh Vetching)			X		
Melilotus altissima (Tall Sweet Clover)					X
GERANIACEAE					
Geranium robertianum (Herb Robert)		X			X
POLYGALACEAE					
P. sanguinea (Field Milkwort)		X			
CELASTRACEAE					
Celastrus scandens (Bittersweet)		X			
HIPPOCASTANACEAE					
Aesculus Hippocastanum (Horse Chestnut)		X			
TILIACEAE					
Tilia american (American Basswood)		X			
VIOLACEAE					
Viola incognita (White Violet)		X			
V. selkirki (Great Spurred Violet)		X			

	New Haven (Oswego Co.)	Port Ontario (Oswego Co.)	St. Lawrence R.	Orleans Co.	Niagara Co.
APOCYNACEAE					
Apocynum sibircum (Clasping-leaved Dogbane)		X			
CONVOLVULACEAE					
Convolvulus arvensis (Field Bindweed)		X			
Cuscuta gronovii (Dodder)		X	X		
Ipomoca purpurea (Morning Glory)		X			
BORAGINACEAE					
Echium vulgare (Blueweed)		X			
OROBANCHACEAE					
Epifagus virginiana (Beachdrops)		X			
PLANTAGINACEAE					
Plantago major (Common Plantain)		X			
MYRICACEAE					
Myrica gale (Sweet Gale)		X			



Extracted from U.S. Fish and Wildlife Service, July 1977.

*Vegetation identified by numbers on the distribution map is identified as follows:

1 Eelgrass (90%) with some Elodea, Nitella, Coontail, Water stargrass, and Watermilfoil. Sandy bottom with vegetation out to about 20 feet from shore to a depth of about 6 feet.

2 Eelgrass (75%). Vegetation 8 - 10 feet deep.

3 Eelgrass (50%) with Slender naiad, Watermilfoil, Coontail, Claspingleaf pondweed, Elodea, Yellow water lily, White water lily, Pickerel weed, Arrow arum, and Duckweed.

4 Predominantly Eelgrass and Ribbonleaf pondweed.

5 Eelgrass (50%) with Watermilfoil, Claspingleaf pondweed, and Coontail.

6 Heavy aquatic vegetation to water's surface. Eelgrass (25%), Elodea (25%), Watermilfoil (25%), and Claspingleaf pondweed and Coontail (25%).

7 Yellow water lily, White water lily, Arrow arum, Elodea, Floatingleaf bur reed, Watermilfoil, Water stargrass, Claspingleaf pondweed and Water shield.

8 Predominantly Eelgrass, Elodea and Watermilfoil.

9 Arrow arum and other emergent vegetation with some Duckweed.

10 Eelgrass (75%) with Elodea, Water stargrass, Watermilfoil, Slender naiad. Some areas were very dense with aquatic vegetation to surface.

11 Yellow water lily.

12 Predominantly Eelgrass with Watermilfoil, Elodea, Water stargrass and Slender naiad. Some areas dense with vegetation.

13 Arrowhead, Arrow arum, Pickerel weed, Cattails, and other emergent and terrestrial vegetation.

Extracted from U.S. Fish and Wildlife Service, July 1977.

RARE AND ENDANGERED SPECIES

I. INTRODUCTION

The following are lists of rare and endangered species from the Lake Ontario and St. Lawrence River shoreline. Information is scarce for mammals and reptiles; and in many areas no information on rare and endangered wildlife exists.

II. BIRDS

	*New York State List**	*U.S. List***	*Other*
Haliaeetus leucocephalus (Bald eagle)	X	X	1,3
Falco peregrinus (Peregrine falcon)	X	X	1,3
F. columbarius (Merlin)			3
F. rusticolus (Gyrfalcon)			3
Pandion habiaetus (Osprey)	X		1,3
Charadrius melodus (Piping plover)			1,3
Gavia stellata (Red-throated loon)			1,3
Larus delawarensis (Ring-billed gull)			1
L. hyperboreus (Glaucous gull)			1,3
L. glancoides (Iceland gull)			1,3
L. marinus (Great black-backed gull)			1,3
Ardea herodias (Great blue heron)			1
Meleagris galloparo (Wild turkey		X	1
Grus canadensis (Greater sandhill crane)		X	
Coccyzus americanus (Yellow-billed cuckoo)			1,3

1. Webb, W.L. et al., 1972
2. Christie, W.J., 1973
3. U.S. Department of Interior, 1977

*N.Y. State Department of Environmental Conservation's Endangered, Exturpated, and Extinct Wildlife of New York State

**U.S. Department of The Interior Fish and Wildlife Service List of Endangered and Threatened Wildlife and Plants, Federal Registrar, Wednesday, January 17, 1979, Part II.

	New York State List*	U.S. List**	Other
Sturnia ulula (Hawk owl)			3
Melanerpes erythrocealus (Red-headed woodpecker)		X	3
Corvus corax (Common raven)			3
Cistothorus platensis (Short-billed marsh wren)			3
Mimus polyglottos (Mockingbird)			3
Regulus setrapa (Golden-crowned kinglet)			3
Vermivora celata (Orange-crowned warbler)			3
Dendroica tigrina (Cape-May warbler)			3
Seiurus motacilla (Louisiana waterthrush)			3
Oporonis agilis (Connecticut warbler)			3
Wilsonia pusilla (Wilson's warbler)			3
Ammodramus henslowii (Henslow's sparrow)			3
Egretta thula (Snowy egret)			1,3
Ixobrychus exilis (Least bittern)			1,3
Plegadis falcinellus (Glossy ibis)			1,3
Cygnus columbianus (Whistling swans)			1,3
Olor columbianus (Whistling swans)			1
Bucephala islandica (Barrow's goldeneye)			1,3
Somateria mollissima (Common eider)			1,3
S. spectabilis (King eider)			1,3
Aquila chrysaetos (Golden eagle)			1,3
Calidris maritima (Purple sandpiper)			1,3
Micropalama himantopus (Stilt sandpiper)			1,3
Tryngites subruticollis (Buff-breasted sandpiper)			1,3
Philomachus pugnax (Ruff)			1,3
Phalaropus fulicarius (Red phalarope)			1,3
P. tricolor (Wilson's phalarope)			1,3
P. lobatus (Northern phalarope)			1,3

III. FISH

Moxostoma macorlepidotum (Shorthead redhead)			3
Notropis cornutus (Common shiner)			3
N. hudsonius (Spotted shiner)			3
N. stramineus (Sand shiner)			3
N. anogenus (Pugnos shiner)			3
N. atherinoides (Emerald shiner)			3
Pimephales notatus (Bluntnose minnow)			3
Rhinchthys atratulus (Blacknose dace)			3
Coregonus clupeaformis (Lake whitefish)			3
Ictalurus melas (Black bullhead)			3
I. natalis (Yellow bullhead)			3
Labidesthes sicculus (Brook silversides)			3

	New York State List*	U.S. List**	Other
III. FISH (CONTINUED)			
Morone chrysops (White bass)			3
Stizostedion canadense (Sauger)			2,3
Cottus bairdii Kumbini (Mottled sculpin)			3
Pungitius pungitius (Ninespine stickleback)			2,3
Lota lota (Burbot)			3
Catostomus commersonni (Lake whitefish)			3
IV. MAMMALS			
Castor canadensis (Beaver)			1,3
Lutra canadensis (River otter)			3
Myotis leibii (Small-footed bat)			3
Sorex palustris (Northern water shrew)			3
Microsorax hoyi (Pygmy shrew)			3
Synaptomys cooperi (Southern bog lemming)			3
Canis lupus (Eastern timber wolf)	X	X	
V. REPTILES			
Clemmys insculpta (Wood turtle)			3
C. muhlebergii (Bog turtle)	X		3
Emydoidea blandingi (Blandings turtle)			3
Coluber constrictor (Black racer)			3
Elaphe obsoleta (Black rat snake)			3

- Endangered and Threatened Animal Species with Present or Prior Range Within the Project Area.

Name	Protection	Status	Range	Habitat	Remarks
			(MAMMALS)		
Indiana Bat (*Myotis sodalis*)	Federal and State	Endangered	Eastern and Midwestern United States	Limestone Cave Areas	Decline due to habitat destruction by commercialization of caves. Roosting caves known along Black River in Jefferson County, NY.
Eastern Timber Wolf (*Canis lupus lycaon*)	Federal and State	Endangered	Eastern USA and Southeast Canada	Wilderness Forests and Tundra Areas	One specimen taken in Fulton County NY in 1968, believed to have been a captive escapee as last previous state recording was in 1899.
Eastern Cougar (*Felis concolor cougar*)	Federal and State	Endangered	Eastern USA and Canada	Wilderness Areas Such as Adirondack Wilderness	No confirmed sightings this century, last New York record in 1894.
Canada Lynx (*Lynx canadensis*)	State	Endangered	NE, NW USA and Across Canada	Wilderness Forests and Swamps	Decline due to logging and habitat destruction. Recent sightings in Adirondack wilderness.
Pine Marten (*Martes americana*)	State	Threatened	Northern USA and Canada	Fir, Spruce, Hemlock Forests; Cedar Swamps	Decline due to logging, trapping and habitat destruction. Occurs in spruce forests in Adirondack wilderness.
Fisher (*Martes pennanti*)	State	Threatened	Northern USA and Canada	Extensive Mixed Hardwood Forests, Cutover	Making strong comeback in New York and New England; common occurrence in
Wilderness Areas	Adirondack wilderness areas.				
			(BIRDS)		
Peregrine Falcon (*Falco peregrinus*)	Federal and State	Endangered (Two Subspecies)	Nearly Cosmopolitan Most N & S Amer.	Nests on cliffs, artic subspecies nests in tundra areas.	Occasional migrant along Lake Ontario and St. Lawrence River. Presently no known nesting in New York. Pesticides main reason for decline.

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

Endangered and Threatened Animal Species with Present or Prior Range Within the Project Area. (Cont'd)

Name	Protection	Status	Range	Habitat	Remarks
Bald Eagle (Haliaeetus leucocephalus)	Federal and State	Endangered	Most of N. America	Nests in trees along rivers, lakes, and oceans. Feeds on fish and carrion; generally a scavenger.	Formerly a common spring and fall migrant along Lake Ontario and St. Lawrence. Six birds (2 adults, 4 juveniles) reported from the Thousand Islands area of St. Lawrence, January to March 1978.
Osprey (Pandion haliaetus)	State	Endangered	Nearly Cosmopolitan in N. America	Feeds on fish, nests near lakes, still water, and beaver flows. Individual nests used for many years.	Observed statewide; St. Lawrence R. valley a known breeding area; apparent reversion of nesting success due to restrictions on pesticide use.
Golden Eagle (Aquila chrysaetos)	State	Threatened	Throughout N. Amer; in east from Ontario south to Tenn.	Nests in high rocky cliffs near open area with water and meadow.	First banding of nestling of this species in eastern N. America was in 1957 from nest in Adirondacks of NY. Six sightings at Derby Hill in 1967
Raven (Corvus corax)	State	Threatened	Holarctic; Northern Canada to NY & New Eng.	Nests in wilderness forest area in trees; feed on insects, small animals and bird eggs.	Common in Adirondacks prior to 1900 with nesting areas in St. Lawrence Co. Decline associated with lumbering of virgin forests. Last nesting pair reported from NY in 1968.
(AMPHIBIANS)					
Bog Turtle (Clemmys muhlenbergi)	State	Endangered	Disjunct pop. in northern and central USA.	Sphagnum bogs, swamps wet meadows; always in very shallow water open to sunlight.	Over harvest by pet dealers and destruction of habitat by drainage of wet areas for development are major reasons for decline.
(FISH)					
Blue (Pike) Walleye (Stizostedion vitreum glaucum)	Federal and State	Endangered	Lake Erie and Lake Ontario.	Moderately Cold, deep waters of large lakes.	Once commercially fished in Lake Erie and Lake Ontario. Over harvest and physical, chemical, and biological changes to environment are reasons for decline. May be extinct.

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

- **Vulnerable Native Plants of New York State Protected Under NYS Environmental Conservation Law 9-1503**

Scientific Name	Common Name(s)
Arisaema dracontium	Dragonroot
	Green-dragon
Asclepias tuberosa	Butterfly-weed
	Chigger-flower
	Orange Milkweed
	Pleurisy-root
Campanula rotundifolia	Bluebell
	Harebell
Celastrus scandens	Bittersweet
	Waxwort
Chimaphila spp.	Pipsissewa
	Prince's-pine
	Spotted Evergreen
	Spotted Wintergreen
	Waxflower
Cornus florida	Flowering Dogwood
Drosera spp.	Daily-dew
	Dewthread
	Sundew
Epigaea repens	Ground Laurel
	Mayflower
	Trailing Arbutus
Euonymus spp.	Burning-bush
	Bursting-heart
	Strawberry-bush
	Wahoo
Filices (Filicinae; Ophioglossales & Filicales)	All ferns, including:
	Adder's-tongue
	Azolla
	Buckhorn

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

- Vulnerable Native Plants of New York State Protected Under NYS Environmental Conservation Law 9-1503 (Cont'd)

Scientific Name	Common Name(s)
Orontium aquaticum	Golden-club
Panax quinquefolius	Ginseng Sang
Pyrus coronaria	Wild Crab Apple
Rhododendron spp.	Azalea Election-pink Great Laurel Honeysuckle Pinxter Pinxter-bloom Rhodomandron Rhodora Rosebay White Laurel
Sabatia spp.	Bitterbloom Marsh-pink Rose-pink Sabatia Sea-pink
Sanguinaria	Bloodroot Puccoon-root Red Puccoon
Sarracenia purpurea	Huntsman's-cup Pitcher-plant Sidesaddle-flower
Silene caroliniana	Wild Pink
Trillium spp.	Bethroot Birthroot Squawroot Stinking Benjamin Toadshade Trillium Wake-robin
Viola pedata	Bird's-foot Violet Pansy Violet

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

- Vulnerable Native Plants of New York State Protected Under NYS Environmental Conservation Law 9-1503 (Cont'd)

Scientific Name	Common Name(s)
Filices (Filicinae; Ophioglossales & Filicales) (Cont'd)	Cliff Brake
	Curly-grass
	Fiddleheads
	Hart's tongue
	Maidenhair
	Moonwort
	Polypody
	Rock Brake
	Salvinia
	Spleenwort
	Walking-leaf
	Wall-rue
	Water-spangle
	Woodsia
	But excluding Bracken (Pteridium aquilinum); Hay-scented Fern (Dennstaedtia punctilobula); Sensitive Fern (Onoclea sensibilis)
Gentiana spp.	Ague-weed
	Blue-bottles
	Gall-of-the-earth
	Gentian
Hydrastis canadensis	Golden Seal
	Orange-root
	Yellow Puccoon
Ilex spp.	Bitter Gallberry
	Black Alder
	Holly
	Hulver
	Inkberry
	Winterberry
Kalmia spp.	Calico-bush
	Lambkill
	Laurel
	Spoonwood
	Wicky

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

Vulnerable Native Plants of New York State Protected Under NYS Environmental Conservation Law 9-1503 (Cont'd)

Scientific Name	Common Name(s)
Lilium spp.	Lily
	Turk's-cap
Lobelia cardinalis	Cardinal-flower
	Red Lobelia
Lycopodium spp.	All Clubmosses, including:
	Bear's-bed
	Buckhorn
	Bunch Evergreen
	Christmas-green
	Coral Evergreen
	Creeping Jenny
	Ground Cedar
	Ground Fir
	Ground Pine
	Heath Cypress
	Running Evergreen
	Staghorn Evergreen
	Trailing Evergreen
	Wolf's-claws
Mertensia virginica	Bluebell
	Roanoke-bells
	Tree Lungwort
	Virginia Bluebell
	Virginia Lungwort
	Virginia Cowslip
Monarda didyma	American Bee-balm
	Indian-heads
	Oswego Tea
	Scarlet Bee-balm
Myrica pensylvanica	Bayberry (Northern)
	Candleberry
Nelumbo lutea	Lotus
	Lotus Lily
	Nelumbo
	Pond-nuts

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

Vulnerable Native Plants of New York State Protected Under NYS Environmental Conservation Law 9-1503 (Cont'd)

Scientific Name	Common Name(s)
Nelumbo lutea (Cont'd)	Water Chinquapin Wonkapin Yellow Lotus
Opuntia humifusa (*O. compressa*, *p.p.*)	Indian Fig Prickly Pear Wild Cactus
Orchidaceae	All Orchids, including: Adam-and-Eve Adder's mouth Arethusa Beard-flower Bog-candle Calopogon Calypso Coral-root Cypripedium Dragon's-mouth Fairy-slipper Grass-pink Kirtle-pink Ladies'-tresses Lady's-slipper Lattice-leaf Malaxis Moccasin-flower Nerve-root Orange-plume Orchis Pearl-twist Pogonia Putty-root Rattlesnake-plantain Scent-bottle Screw-auger Snake-mouth Soldier's-plume Swamp-pink Three-birds Twayblade Whipporwill-shoe

Extracted from St. Lawrence Seaway, N.Y. Feasibility Study, June 1978.

WILDLIFE HABITATS

I. INTRODUCTION

The wildlife habitats on the Lake Ontario shorelines are concentrated in the littoral zone and wetlands. New York State has 18,395 acres of shoreline immediately adjacent to Lake Ontario.[20] A 1953 inventory of wetlands by the U.S. Department of Interior recorded New York as having 515,100 acres of wetlands in the Atlantic fly-away, which includes inland areas in both Lakes Erie and Ontario.[10] State-owned underwater wetlands numbered 39,353 acres or 42% of the 94,630 acres of wetlands were rated as high to moderate quality habitats.[10] Of these 39,353 acres, 1,041 were destroyed between 1959-1967. Highway, marina and cottage development on the shoreline have caused fish and wildlife losses within 17,508 (45% of the 39,353) acres.[10] By the 1969 inventory the acreage for wetlands in Oswego County, Jefferson County, and St. Lawrence County dropped from 56,170 in 1954 to 9,776 acres.[10] In 1972 the St. Lawrence County had 1,551 acres and Jefferson County had 12,362 acres; Oswego County had 39,430 acres;[19] Wayne County had 6,000 acres.[14]

Only recently has the importance of wetlands been recognized. Wetlands provide breeding, nesting and feeding grounds for wildlife such as waterfowl, shorebirds and reptiles. They serve as settling basins for stream runoff and therefore may act as natural pollution treatment systems for biodegradable matter. However, continued deterioration of water quality and habitat will impair and possibly destroy the region's fishery industry and recreation resources.

II. LITTORAL ZONES

Littoral zones are rich in plant and animal life and provide food for land animals and birds. Common terns, ring-billed gulls and various other species of shore birds feed and nest on sand and gravel beaches. The littoral zone provides spawning grounds for many species of fish. Herring, gulls, and other wading birds use the shallow waters as feeding grounds, Mudflats in the littoral zone provide nesting and breeding areas for other species of wildlife.

III. WETLANDS

Wetlands are areas inundated by surface or ground water frequent enough to support a prevalence of vegetative or aquatic life that requires saturated soil for growth and reproduction. These areas include marshes, swamp and flooded forests.

Bays and marshes are among the most fertile of breeding areas in the world. They provide breeding, nesting and feeding grounds for a variety of fish and birds. Marshes are prime habitat for puddle ducks, a favorite game bird. Herons, terns, plovers, songbirds, raccoons, beaver, muskrat and mink also inhabit these areas. Lake Ontario wetlands fill a place in bird migration routes, especially for geese and swan. They serve as breeding areas for birds which go no further south. Some bald eagles and whistling swan, rare to the area, have been sited in Lake Ontario marshlands. Many marshes are spawning areas for game fish such as bullhead, calico bass, largemouth bass, northern pike and perch. Walleye pike and smallmouth bass migrate to

channels in the wetlands for short durations.

Maximum production and growth of aquatic and shore wildlife benefit from limited fluctuations in water levels. However, destruction of shoreline marshes increases during lower lake levels. During these times marsh areas are accessible for residential and recreational uses. The preservation, protection and management of some wetlands is important to preserve the beauty, interest and character of the area.

IV. INVENTORY OF SPECIFIC HABITATS ALONG THE LAKE ONTARIO - ST. LAWRENCE SHORELINE

A. Orleans County

1. Johnson Creek: One of five Lake Ontario creeks important as major fishery streams.

2. Oak Orchard Creek: One of five Lake Ontario creeks important as major fishery streams.

3. Oak Orchard Swamp: This is one of two migrating geese congregating areas on the Lake Ontario shoreline. It attracts between 20,000 and 30,000 geese at the peak of the season.[22]

B. Monroe County

Monroe County has 350 to 400 wetland areas. Approximately a dozen areas attract waterfowl. There is an abundance of birds to be found as the area lies on the Lake Erie - Lake Ontario Forest flyaway, the Ohio Valley migration route and the Appalachian Flyaway.[22]

1. Braddock Bay: Braddock Bay is a unique wildlife habitat. Once a breeding area for smallmouth bass, by 1971 they had all disappeared. Many other species concentrate in the Braddock

Bay area and spawn there. It is a popular bird watching area. The protected open water attracts geese, swan, ducks, gulls, sandpipers and shore birds. The cattail marshes attract herons and other marsh birds while the woodlands attract owls and woodpekers. It is one of the best areas in the nation to watch spring migrations of hawks. Furbearing mammals, such as muskrats, mink and racoons also inhabit the area. Braddock Bay recieves domestic wastes through the discharge of West, Salmon, Brockport and Buttonwood Creek as well as others. This nutrient loading causes algae blooms and weeds which spoil sport fishing and recreation. Plans to improve and enlarge recreation facilities by filling low or wetlands will reduce the littoral zone.[22]

2. Island Cottage woods: These woods are surrounded on all areas by water or cattail marshes. The woods attract large numbers of fish comprised of approximately 75 species.[22]

3. Rose's Marsh: Located just west of Braddock Bay. High waters have eliminated much of the cattail growth in this marsh. It has returned to its original habitat of thickets and small ponds. It is now an excellent habitat for a variety of herons.[22]

4. Hamlin Beach: Four habitat types are present in this excellent birding area. High sand bluffs attract waterfowl and gulls. The shoreline attracts shore birds. Owls and other birds look for winter shelter in the dense coniferous woods. Small marshes and creeks attract a variety of marsh birds.[22]

5. Charlotte: This lakeshore birding area attracts over 12 species of birds.[22]

C. Wayne County

The county has bought 6,000 acres of wetlands around and between bays, primarily in the towns of Huron and Wolcott.

1. Maxwell Bay: This is an important fish, wildlife and recreation area.

D. Oswego County

1. Deer Creek Marsh: This important marsh area consists of 1200 acres. Protected from wave and ice abuse by a dune area, it provides a great variety of habitat, with a high level of fish and wildlife production potential. Oak and pine trees provide vegetative cover on a raised area. Shrubby thickets made up of willow, alder and dogwood and swales of sedges and grasses complete the vegetation. Deer Creek is the habitat of several small fur bearers as well as some deer. The marsh and littoral area are spawning grounds for many fish. Waterfowl, such as mallards, black ducks, blue-winged teal, killdeer, spotted sandpiper, common snipe and redbreasted merganser use the marsh as summer breeding grounds. Other bird species, such as goldeneye, geese, scaup, bufflehead and oldsquaw use this area for rest stops during spring and fall migrations. Such non-game bird species as plover, yellowleg, egrets and curlews also use the marsh as migration stopovers. This marsh has some of the best wildlife habitat in the area.

2. Selkirk Shores State Park: Located north of Deer Creek Marsh, the park has many species of hardwoods including sugar maple, red oak, ash, beech, cherry, white pine and hemlock. Wildlife species found there include raccoon, deer, squirrel, chipmunk, cedar waxwings and downy woodpecker.

3. Health Camp Road Marsh; Snake Creek Marsh; Butterfly Creek Marsh; Ramona Beach and Grindstone Creek: In 1979 these areas were cited for their high value for fish and wildlife.

4. Oswego Harbor: This is a major wintering area for waterfowl.

E. Jefferson County

The St. Lawrence - Eastern Ontario area has many areas of unique or important habitat. Smallmouth bass, yellow perch, brown bullhead, and pumpkinseed spawn in inshore habitats and streams of the region. Wetlands at the mouth of tributaries, the St. Lawrence River and bays along Lake Ontario are excellent spawning areas for northern pike and muskellunge. The northern pike fishery of the Thousand Island, Cape Vincent and Henderson Harbor is virtually linked to the spawning habitat.

1. Lake Ontario Dunes: The dune area is the only one of its kind in the area. It hosts shore birds during migrations. The dunes are a unique habitat which could possibly be nesting areas for the rare piping plover. This is considered a fragile environment.[12]

2. Henderson High Banks and Lake Ontario Islands are considered unique habitats for many species of fish and rare birds.[12]

3. Wilson Bay Marsh: This marsh area attracts many species of ducks, as well as black-crowned night herons: The brushy marsh and wooded swamp is breeding ground for black terns, as well as a habitat for other birds, mammals, reptiles and amphibians. The area is important for the diversity and rarity of species.[12]

4. Wilson Hill Wildlife Management Area: This is an excellent habitat for mallards, black ducks, baldpates and blue-winged teal because of its shallow habitat.[12]

5. Cranberry Marsh: The 140 acres of pond and wood swamps provide breeding areas for ducks and other wildlife. A 200 foot wide barrier beach separates the marsh from Lake Ontario. Beavers build dams which control the water levels.[12]

6. Grindstone Island; Flynn Bay; McCrae Bay; and Delaney Marsh: These areas are high productivity wetlands. Located on islands, they have not yet been impacted by mainland development.[12]

7. Black Pond Marsh Complex: This area provides several types of habitat. A barrier beach protects the marsh from wind and wave action. The open water attracts many species of waterfowl. Land birds, dabbling ducks and divers, and other larger species use the marsh as habitats.[12]

8. Minna Anthony Common Nature Center: This wildlife sanctuary offers a diversity of habitat: old field, marsh, weeds, pond, river and a cultured area. Rare plants and unusual animals (such as the goshawk) are found there. Controlled hunting, fishing, hiking and wildlife observation are allowed.[12]

9. Thousand Islands: This is an important habitat for many water-fowl and large birds. Comorants which require areas free of disturbance for nesting, are especially plentiful.[12]

10. Lakeview Wildlife Management Area: This is a 2500 acre cattail marsh protected by sand dunes. The vegetative cover of marshes, woods, fields and lakeshore marsh provide unique habitat for diverse biota.[12]

11. Black Ash Swamp: The unique habitat of extensive wet woods provides cover and nesting areas for several larger species of mammals. It is a probable breeding area of the barred owl, pileated woodpecker, and several rapters.[12]

12. Ironsides Island: Acquired by the nature conservancy, the area is an important Great blue heron rookery.[12]

13. Galloo Island Cliffs: This is an excellent habitat for cliff dependent fauna such as peregrine falcon (Duck hawk) and other rare species.[12]

14. Little Galloo Island: Reputed to be the largest nesting colony of the rare ring-billed gull in the world, the island is also a breeding area for the double-crested comorants.[12]

15. Point Peninsula Marsh: A brushy swamp, this area is an important breeding and nesting area. Productivity of the area could be increased by water levels control, creation of potholes and channel development.[12]

16. Kent Creek Marsh: This is a breeding area for duck and beavers. It is a potentially excellent area for waterfowl breeding if the water levels can be controlled. Pheasants winter in the marsh area.[12]

17. Ashland Wildlife Management Area: Recently purchased by the state, this is an important habitat area for many birds.[12]

18. Favret Swamp: This area abounds in beaver, mink and woodland birds.[12]

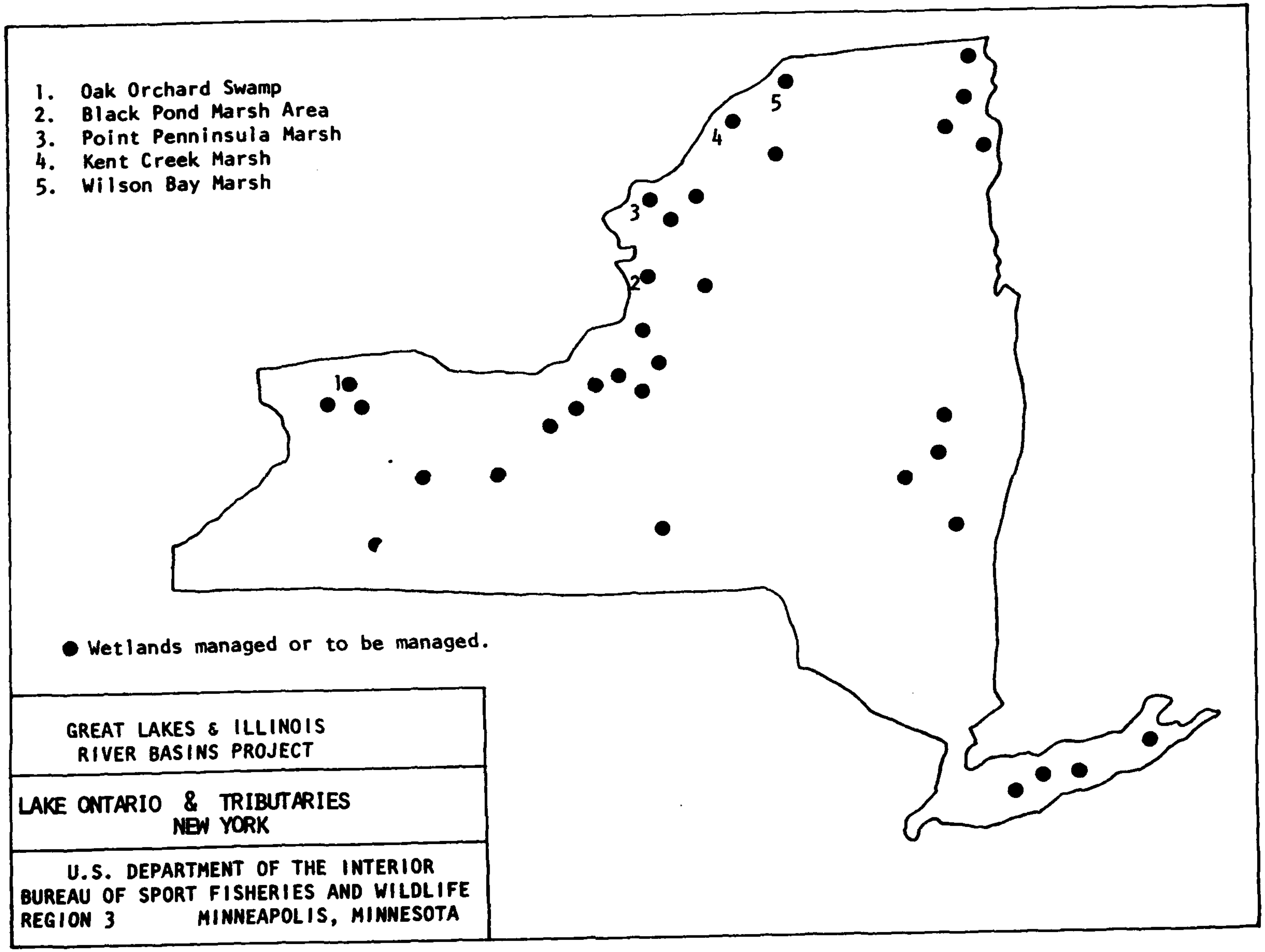
19. Eldorado Shores: The algae-covered rock area attracts the largest shorebird concentration in the area.[12]

20. French Creek, Cranberry Creek, Chippewa Creek: These are breeding and resting grounds erased by hunters, teappers and naturalists.[12]

21. Perch River Game Management Area: High duck production in this 3000 acre area is apparently due to controlled water levels.[12]

22. Alexandria Town: The Pitch Pine Forest of Plessas is a unique ecological area.[12]

23. North Sandy Pond: This pond provides a variety of interesting habitat: marsh, open water, islands, littoral zone, barrier dunes, beaches and upland forests.[12]



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ANTICIPATED ALTERATIONS

It has been difficult to gather definitive information on proposed anthropogenic alterations, such as the construction of new parks, marinas, industrial parks, etc., in the study area. This in part is due to the fact that much of the land projected for such use has not been purchased and those who plan the development do not want to relate their designs for fear that the price of property for construction and for access will be inflated. Others do not want to reveal their plans until they are further along in the Environmental Impact Statement preparation process.

The Lakeside Beach State Park, with shoreside camping areas together with a marina and bathing beach, is being expanded by the Genesee State Park Commission thirty-eight miles west of Rochester.[1] At Oak Orchard Marine Park in Orleans County parking areas are being constructed.[2]

At Port Ontario Harbor, at the mouth of the Salmon River near Selkirk in Oswego County, a small boat navigation harbor of refuge for recreation craft is being developed by the Corps under the sponsorship of the New York State Department of Environmental Conservation. Plans include the installation of a 900 by 400 feet turning basin that will be 8 feet deep. The basin will be accessible to the lake via a 100-feet wide channel. The mouth of the channel will be protected by steel sheet piling.[4]

A number of plans are being discussed that involve the

excavation and protection of the inlet to Irondequoit Bay. However, because of intense conflicting pressures from a variety of public and private sectors, the nature and extent of the project is in doubt.

Numerous efforts to abate shoreline erosion are being planned primarily on property on the lakeshore and tributaries to Lake Ontario. Few efforts in residential areas appear to be concerted. The end result probably will be aggravated erosion on adjacent property and/or end erosion. While some property owners have filed plans with the Corps and/or local building inspection departments, many have not done so. (Most of the latter do not appear to know that they are required to do so.)

The nature of the proposed Lake Erie-Ontario (All-American) Canal will not be presented in this report since the possible ramifications of this waterway are being studied by the Corps and are readily available at the Buffalo District office.

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PERTINENT ONGOING STUDIES

A number of federal and state agencies presently are conducting projects that have a direct bearing on the Lake Ontario nearshore region. Since many of these efforts will be completed and/or generate products pertinent to this review in the near future, their existence is called to the attention of the reader.

The New York State Department of Environmental Conservation is attempting to compile data on what they therm "significant habitats". These include areas they believe contain rare and/or endangered species, important breeding, feeding, and/or resting areas (i.e. stop-overs on flyways), or otherwise unique natural features that warrant their protection. A set of New York State-wide maps presently are being printed showing an initial listing of these sites, including some along the Lake Ontario shoreline. It is estimated that up to fifty (50) sites will fall within the scope of the Corps Lake Ontario nearshore concerns.

The Cortland, New York Office of the U.S. Fish and Wildlife Service is compiling a list of critical habitats along the Lake Ontario shoreline for fish breeding and feeding. These data also are expected in the near future.

An investigation regarding the possible ecological impacts of the extension of the Great Lakes winter navigation season on the St. Lawrence River is being coordinated through the Great Lakes Basin Commission in Ann Arbor, Michigan with funds from the Detroit District of the U.S. Army Corps of Engineers. The Basin Commission has subcontracted four studies. Three -- Fisheries Study

(BioSystems Research Inc., Buffalo), Analysis of Control Sites (Clarkson College and Dr. E.W. Marshall) and Water Fowl, Water Birds and Raftors (Hazelton Environmental Sciences, Northbrook, Illinois) -- are field efforts focusing on the approximately 20-mile area between Prescott and Galop Island. A fourth is a literature review contrasting the St. Lawrence and St. Mary's Rivers (University of Michigan, Ann Arbor). Results of these studies are due by 31 July 1979.

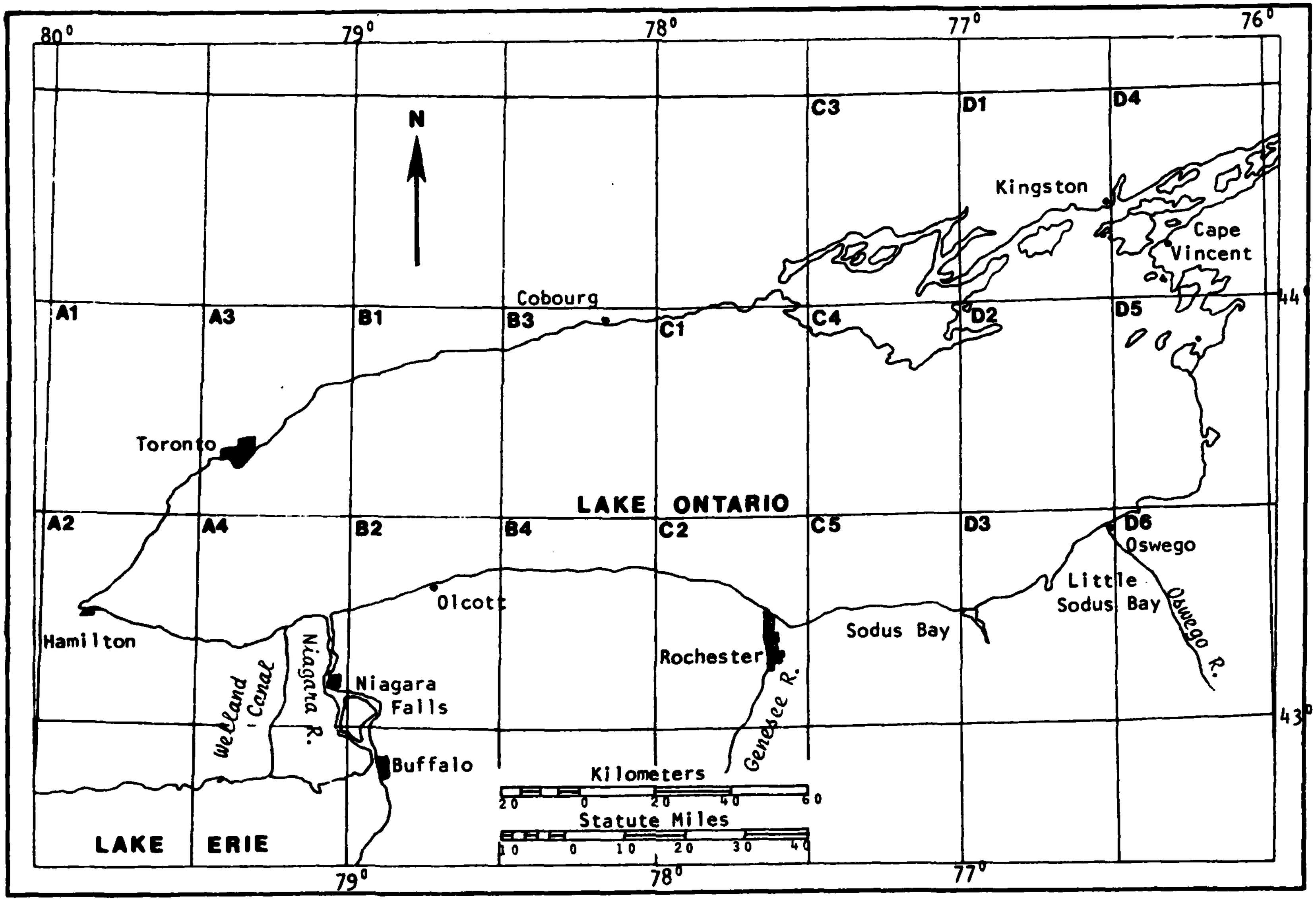

FIGURE 1 Geographic Coding

G Code 6 (Great Lakes) 1, 2, 3, 8, 10, 11, 12, 13, 15, 17, 20, 22, 24, 25, 27, 28, 29, 32, 33, 34, 35, 37, 38, 47, 50, 52, 54, 57, 58, 59, 61, 62, 65, 69, 71, 75, 78, 84, 85, 86, 91, 92, 93, 97, 98, 100, 101, 102, 103, 105, 106, 107, 108, 113, 115, 116, 118, 120, 121, 125, 126, 130, 131, 136, 138, 141, 144, 149, 150, 152, 161, 162, 163, 165, 169, 170, 171, 172, 173, 174, 175, 177, 178, 179, 181, 182, 196, 197, 198, 203, 204, 205, 206, 207, 208, 209, 211, 213, 215, 217, 219, 220, 225, 226, 229, 236, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 255, 256, 257, 259, 260, 262, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 279, 280, 281, 282, 283, 285, 290, 294, 296, 297, 299, 300, 306, 307, 317, 325, 328, 329, 333, 335, 339, 340, 343, 344, 347, 349, 354, 355, 356, 357, 358, 366, 367, 370, 371, 382, 383, 397, 402, 405, 406, 408, 412, 413, 415, 416, 417, 434, 436, 441, 442, 443, 444, 445, 448, 451, 452, 460, 462, 463, 464, 465, 481, 482, 486, 487, 488, 489, 490, 491, 497, 499, 505, 510, 511, 512, 513, 514, 515, 517, 521, 522, 523, 524, 525, 526, 529, 530, 533, 536, 537, 539, 540, 541, 543, 544, 546, 548, 555, 556, 561, 562, 576, 582, 584, 609, 613, 614, 615, 617, 619, 621, 622, 624, 625, 626, 627, 628, 629, 634, 637, 639, 641, 643, 645, 649, 650, 652, 660, 663

G Code 5 (Lake Ontario) 1, 3, 5, 6, 8, 9, 10, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 33, 34, 37, 38, 40, 41, 44, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, 59, 60, 63, 69, 70, 74, 75, 76, 77, 80, 81, 82, 84, 85, 86, 87, 88, 89, 91, 94, 97, 101, 104, 107, 108, 109, 112, 114, 115, 118, 119, 120, 121, 124, 125, 126, 128, 130, 139, 140, 141, 142, 144, 146, 147, 148, 150, 152, 161, 163, 164, 165, 166, 167, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 193, 196, 197, 198, 199, 203, 204, 205, 206, 207, 209, 210, 211, 214, 215, 216, 217, 218, 223, 224, 227, 228, 236, 237, 238, 239, 240, 242, 243, 245, 246, 247, 248, 249, 251, 252, 253, 255, 258, 259, 262, 271, 273, 274, 276, 280, 281, 282, 283, 289, 290, 291, 293, 294, 295, 296, 300, 306, 307, 308, 309, 311, 312, 317, 318, 323, 324, 325, 326, 327, 328, 329, 330, 334, 335, 338, 339, 343, 346, 348, 350, 351, 355, 357, 362, 365, 366, 367, 368, 370, 371, 372, 374, 375, 376, 377, 378, 379, 380, 382, 383, 390, 392, 393, 394, 395, 398, 400, 401, 402, 403, 404, 405, 406, 407, 409, 410, 411, 412, 414, 415, 417, 418, 419, 422, 423, 424, 427, 429, 430, 432, 433, 434, 435, 436, 437, 438, 440, 441, 442, 444, 445, 446, 447, 448, 452, 453, 457, 458, 459, 461, 464, 466, 483, 487, 489, 490, 491, 492, 493, 494, 497, 498, 499, 501, 502, 503, 504, 505, 507, 508, 509, 510, 512, 513, 514, 515, 517, 519, 521, 522, 523, 525, 526, 528, 529, 530, 534, 536, 537, 540, 541, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 556, 557, 562, 571, 576, 581, 585, 608, 609, 612, 613, 614, 615, 617, 618, 619, 620, 622, 624, 625, 628, 629, 630, 631, 632, 634, 635, 637, 638, 639, 641, 643, 649, 650, 651, 652, 653, 655, 656, 658, 660, 661

G Code 5 A 18, 74, 127, 305, 316, 467, 636

G Code 5A2 31, 66, 260, 305, 360, 505, 665

G Code 5A4 7, 18, 31, 43, 67, 72, 96, 111, 123, 132, 145, 193, 213, 221, 260, 292, 298, 304, 305, 331, 332, 358, 360, 362, 384, 399, 426, 428, 449, 506, 571, 610, 646, 647, 659, 662, 664, 665, 666

G Code 5A4T1 (Welland Canal, Ontario) 7, 426, 583

LAKE ONTARIO SHOREPROTECTION STUDY

SECTION THREE - BIOBLIOGRAPHY

JULY 1979

U. S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

1 ADAMS, CHARLES E.; SMITH, LESTER W.;
PETROGRAPHIC AND CHEMICAL PROPERTIES OF GREAT LAKES ICE;
(1973) PROC 16TH CONF GREAT LAKES RES, P626-639;
ICE; CHEMICAL COMPOSITION; ICE-SNOW PHYSICAL PROPERTIES;
IGR-C16-1973; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
ICE AND SUBJACENT WATER SAMPLES WERE COLLECTED BY THE LAKE SURVEY CENTER AT 11 SITES ALONG THE PERIMETERS OF THE GREAT LAKES DURING THE WINTERS OF 1970-1971 AND 1971-1972. PETROGRAPHIC AND CHEMICAL PROPERTIES WERE EXAMINED IN THE LABORATORY. MOST SAMPLES FELL INTO 2 CLASSES BASED ON THE CRYSTALLOGRAPHIC C-AXIS ORIENTATION OF THE SECONDARY ICE. HORIZONTALLY ORIENTED SAMPLES WERE MOSTLY FROM LAKE SUPERIOR AND VERTICALLY ORIENTED SAMPLES WERE MOSTLY FROM THE OTHER GREAT LAKES. THE CLIMATOLOGICAL CONDITIONS PRESENT DURING ICE FORMATION GOVERN THIS SELECTION. CATION CONCENTRATIONS IN SNOW ICE SAMPLES WERE HIGHLY VARIABLE, HOWEVER, CATION CONCENTRATIONS IN ALL COLUMNAR ICE SAMPLES WERE RELATIVELY UNIFORM DESPITE THE CHEMICAL DIFFERENCES FOUND IN THE SUBJACENT WATER SAMPLES. THE UNIFORMITY IS EXPLAINED ON THE BASIS OF A DIFFERENCE IN FREEZING OR GROWTH RATE FROM NORTH TO SOUTH;

2 ADAMS, DAVID A.;
ROLE OF THE GREAT LAKES IN THE NATIONAL PROGRAM OF MARINE SCIENCES;
(1969) 12TH CONF. FOR GREAT LAKES RES. 16FF;
POLLUTION; WATER; REGULATION; REGULATORY AGENCY;
161C; GCODE6;

3 AINSWORTH, E. JOHN; BORAK, THOMAS B.; EDGINGTON, DAVID N.; KISIELESKI, WALTER E.; WINTERS, TOBEY L.; WOLSKY, ALAN M.; YUAN, YUCHIEN;
GREAT LAKES WATERS: RADIATION DOSE COMMITMENTS, POTENTIAL HEALTH EFFECTS, AND COST-BENEFIT CONSIDERATIONS;
(1977) ARGONNE NATIONAL LABORATORY. PP. 52.;
COST-BENEFIT ANALYSIS; PUBLIC HEALTH; RADIOACTIVITY; TED 50; MEASUREMENT; CESIUM; FISH; MONITORING; RADIUM; WATER; CALCULATIONS;
ANL-ES-56; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
IN 1972, A GREAT LAKES WATER QUALITY AGREEMENT WAS SIGNED BY THE UNITED STATES AND CANADIAN GOVERNMENTS. IT WAS STIPULATED THAT THE OPERATION AND EFFECTIVENESS OF THE AGREEMENT WERE TO BE REVIEWED COMPREHENSIVELY IN 1977. ASPECTS OF THE AGREEMENT CONCERN NONDEGRADATION OF GREAT LAKES WATERS AND MAINTENANCE OF LEVELS OF RADIOACTIVITY OR OTHER POTENTIAL POLLUTANTS AT LEVELS CONSIDERED AS LOW AS PRACTICABLE. A REFINED RADIOACTIVITY OBJECTIVE OF ONE MILLIREM IS PROPOSED IN THE WATER QUALITY AGREEMENT. THE IMPLICATIONS OF ADOPTION OF THIS OBJECTIVE ARE NOT KNOWN FULLY. THE DIVISION OF ENVIRONMENTAL IMPACT STUDIESWAS COMMISSIONED BY ERDA'S DIVISION OF TECHNOLOGY OVERVIEW TO SUMMARIZE THE INFORMATION AVAILABLE ON THE CURRENT LEVELS OF RADIOACTIVITY IN GREAT LAKES WATERS, COMPUTE RADIATION-DOSE COMMITMENT (INTEGRATED DOSE OVER 50 YEARS AFTER CONSUMATION OF 2.2 LITERS OF WATER FOR ONE YEAR), AND TO COMMENT ON THE FEASIBILITY AND COST-BENEFIT CONSIDERATIONS ASSOCIATED WITH THE REFINED ONE-MILLIREM OBJECTIVE. CURRENT LEVELS OF RADIOACTIVITY IN THE WATERS OF LAKES MICHIGAN, ONTARIO, ERIE, AND HURON RESULT IN DOSE COMMITMENTS IN EXCESS OF 1 MREM FOR WHOLE BODY AND 6 MREM FOR BONE. FUTURE PROJECTIONS OF ISOTOPE CONCENTRATIONS IN GREAT LAKES WATER INDICATE SIMILAR DOSE COMMITMENTS FOR DRINKING WATER IN THE YEAR 2050. REDUCTION OF THE LEVELS OF RADIOACTIVITY IN GREAT LAKES WATERS IS NOT FEASIBLE, BUT COST-BENEFIT CONSIDERATIONS SUPPORT REMOVAL OF E226RA AND E90SR THROUGH INTERCEPTIVE TECHNOLOGY BEFORE WATER CONSUMPTION. ADOPTION OF THE ONE-MILLIREM OBJECTIVE IS NOT PROPITIOUS.;

4 ALEXANDER, MAURICE M.;
AMPHIBIANS AND REPTILES OF THE ST. LAWRENCE RIVER;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP217-231;
AMPHIBIANS; REPTILIA; SPECIES DIVERSITY;
NY-US-PR-SL; GCODE7;

5 ALLEN, ERIC R.;

LAKE ONTARIO ATLAS: CHEMISTRY;
(1977) NY SEA GRANT INSTITUTE, NYSSGP-CA-77-016, 192P;
WATER QUALITY; NUTRIENTS; CHEMICAL CHARACTERISTICS; NITROGEN; PHOSPHORUS;
ORGANIC PESTICIDES;
US-CN-NY-OA-77-016; GCODE5;
THE CHEMICAL AND WATER QUALITY CHARACTERISTICS OF LAKE ONTARIO REPORTED PRIOR TO IFYGL, 1972-73 HAVE BEEN REVIEWED AND SUMMARIZED. THE LOW SURFACE-TO-VOLUME RATIO OF THIS LAKE HAS ALLOWED IT TO RETAIN OLIGOTROPHIC CHARACTERISTICS BASED UPON BIOLOGICAL PARAMETERS. HOWEVER, SOME OF THE CHEMICAL PARAMETERS, INCLUDING THE NUTRIENT INPUTS AND CONCENTRATIONS, SUGGEST THAT EUTROPHICATION IS IMMINENT. IN GENERAL, THE WATER QUALITY OF LAKE ONTARIO IS GOOD AND PROJECTED INCREASES IN THE LOADINGS OF MAJOR IONS DO NOT POSE A THREAT TO THE USE OF THIS NATURAL WATER RESOURCE DURING THE REST OF THIS CENTURY. THE INPUT OF TRACE MATERIALS, SUCH AS THE HEAVY METALS AND REFRACTORY ORGANIC COMPOUNDS, IS CAUSE FOR CONCERN SINCE A SIGNIFICANT CONTRIBUTION IS MADE BY AN UNCONTROLLABLE SOURCE, NAMELY ATMOSPHERIC PRECIPITATION. MORE STRINGENT CONTROLS ON THE DISCHARGE OF PHOSPHORUS, TRACE ELEMENTS AND SYNTHETIC ORGANIC COMPOUNDS IS RECOMMENDED TO PRESERVE THE INTEGRITY OF LAKE ONTARIO FOR THE CONTINUED BENEFIT OF ALL USERS OF ITS WATERS;

6 ALLEN, HERBERT E;
CHEMICAL CHARACTERISTICS OF LAKE ONTARIO;
(1969) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 14. PP 1-180;
SODIUM; POTASSIUM; CALCIUM; PH; ALKALINITY; WATER QUALITY; SILICA; OXYGEN;
CHEMISTRY;
GLF-TR14; GCODE5;
RECORDS ARE PRESENTED OF NA+, K+, SIO2, PH, ALKALINITY, O2, AND SPECIFIC CONDUCTANCE AT 100 STATIONS IN LAKE ONTARIO. THESE DATA ARE COMPARED FOR EAST-WEST AND SURFACE-SUBSURFACE VARIATIONS. WATER QUALITY IN LAKE ONTARIO IS SIMILAR TO THAT IN LAKE ERIE WITH THE EXCEPTION OF DISSOLVED OXYGEN. THE OPEN WATERS OF LAKE ONTARIO HAD NO AREAS OF SERIOUS OXYGEN DEPLETIONS.;

7 ANDRLE, ROBERT F.;
GULLS ON THE NIAGARA FRONTIER,
(1977) BUFFALO SOCIETY OF NATURAL SCIENCES MISCELLANEOUS CONTRIBUTIONS NO. 20, 16P;
AVES; LARIDAE; MIGRATION;
BUF-BSNS-MC20; GCODE5A4; GCODE465; GCODE5A4T3;

8 APPLEGATE, VERNON C.; JOHNSON, B. G. HERBERT; SMITH, MANNING A.;
THE RELATION BETWEEN MOLECULAR STRUCTURE AND BIOLOGICAL ACTIVITY AMONG MONONITROPHENOLS CONTAINING HALOGENS;
(1966) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT 11.;
NITROPHENOLS; FISH; PETROMYZON MARINUS; SALMO GAIRDNERI; HALOGENS; METHODS, BIOASSAY; LARVAE;
GLF-11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE RESULTS OF TESTS OF THE BIOLOGICAL ACTIVITY OF CERTAIN NITROPHENOLS CONTAINING HALOGENS ARE REPORTED. SOME OF THESE ARE SHOWN TO BE SIGNIFICANTLY MORE TOXIC TO THE LARVAE OF THE SEA LAMPREY (PETROMYZON MARINUS) THAN TO FISHES. IT IS PROPOSED THAT THE DEATH OF LAMPREY LARVAE EXPOSED TO THESE COMPOUNDS RESULTS FROM AN ACUTE HYPOTENSION (SHOCK) WITH CONCOMMITANT CIRCULATORY AND RESPIRATORY FAILURE. RAINBOW TROUT (SALMO GAIRDNERI), ON THE OTHER HAND, APPEAR TO DIE, AT HIGHER CONCENTRATIONS OF THE TOXIN, DUE TO A CHEMICALLY-CAUSED MECHANICAL INTERFERENCE WITH RESPIRATION THROUGH THE GILLS. A SYSTEMATIC SERIES OF STUDIES OF MONONITROPHENOLS CONTAINING HALOGENS DISCLOSED THAT THOSE PHENOLS HAVING THE NITRO GROUP IN THE PARA-POSITION AND A HALOGEN ATOM OR GROUP IN THE META-POSITION ARE GENERALLY MORE TOXIC TO LAMPREYS THAN TO FISH. THE HALOGENS OR HALOGEN GROUPS USED IN THIS STUDY WERE FLUORINE, CHLORINE, BROMINE, AND TRIFLUOROMETHYL. THE SAME SUBSTITUENTS IN OTHER POSITIONS ONLY OCCASIONALLY GAVE RISE TO SELECTIVELY TOXIC COMPOUNDS. THE RELATIONSHIP BETWEEN THE SELECTIVELY ACTIVE CLASS OF NITROPHENOLS CONTAINING HALOGENS AND OTHER RELATED STRUCTURES IS DISCUSSED.;

9 ARCHER, JOHN D.;
SUMMARY REPORT ON PHOSPHORUS REMOVAL;

(1978) ONTARIO MINISTRY OF THE ENVIRONMENT POLLUTION CONTROL BRANCH RESEARCH REPORT NO. 63, 66P;
PHOSPHORUS REMOVAL; FACILITIES; SLUDGE TREATMENT; ECONOMICS; PRIMARY TREATMENT; SECONDARY TREATMENT;
CAN-EN43-11/63; GCODE3; GCODE4; GCODE5;
THIS REPORT COVERS THE FINDINGS OF THE PHOSPHORUS REMOVAL STUDIES CARRIED OUT ON WASTEWATER TREATMENT PLANTS UNDER THE CANADA-ONTARIO AGREEMENT ON GREAT LAKES WATER QUALITY. PHOSPHORUS REMOVAL CAN BE ACHIEVED AT ANY EXISTING WASTEWATER TREATMENT PLANT WITH THE ADDITION OF IRON SALTS, ALUMINUM SALTS OR LIME. SINCE ESSENTIALLY ANY OF THESE 3 CHEMICALS CAN ADEQUATELY REMOVE PHOSPHORUS AT A WASTEWATER TREATMENT PLANT, THE PURPOSE OF THE TREATABILITY STUDIES DESCRIBED IN THIS REPORT WAS TO DETERMINE WHICH CHEMICAL WOULD MOST ECONOMICALLY REMOVE THE PHOSPHORUS TO THE REQUIRED LEVEL, YET BE TOTALLY COMPATIBLE WITH THE EXISTING TREATMENT PROCESS. INFORMATION WAS COLLECTED ON THE PHOSPHORUS REMOVAL FACILITIES INSTALLED AT WASTEWATER TREATMENT PLANTS, TO COMPARE THE ACTUAL PERFORMANCE OF THESE FACILITIES WITH THE PREDICTIONS THAT WERE MADE FROM TREATABILITY STUDIES. THE 2-STAGE TREATMENT STUDY (JAR AND FULL-SCALE TESTING) WAS FOUND TO BE THE MOST RELIABLE METHOD OF SELECTING THE APPROPRIATE CHEMICAL AND DOSAGE RATE. OPERATIONAL PROBLEMS, AND CAPITAL AND OPERATING COSTS ARE PRESENTED AND DISCUSSED;

10 ARMSTRONG, DAVID E.; LEE, KWANG W.; UTTORMARK, PAUL D.; KEENEY, DENNIS R.; HARRIS, ROBIN F.;
POLLUTION OF THE GREAT LAKES BY NUTRIENTS FROM AGRICULTURAL LAND;
(1974) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES VOLUME 1, PP166;
NUTRIENT LOADING; WATER QUALITY; PHOSPHORUS; NITROGEN; AGRICULTURAL POLLUTION;
IJC-LW-VOL. 1; GCODE1, GCODE2; GCODE3; GCODE4 OR GCODE5; GCODE6;

11 ARNO, NORMAN;
OVERVIEW OF THE PROGRAMS IN THE GREAT LAKES OF THE UNITED STATES CORPS OF ENGINEERS;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP103-113;
RESEARCH; PROGRAMS; US; REGULATORY AGENCY,
US-FCS-P1972; GCODE6;

12 ARON, WILLIAM I.; SMITH, STANFORD H.;
SHIP CANALS AND AQUATIC ECOSYSTEMS;
(1971) SCIENCE. VOL. 174. PP13-20;
CANALS; ECOLOGY; ERIE CANAL; WELLAND CANAL; FISH; ABUNDANCE; ALOSA PSEUDOHARENGUS; SALMO SALAR; SALVELINUS NAMAYCUSH; LEUCICHTHYS ARTEDI; PETROMYZON MARINUS; MORONE AMERICANA; OSMERUS; LOTA LOTA; COREGONUS CLUPEAFORMIS; CATOSTOMUS; MOXOSTOMA; STIZOSTEDION VITREUM; NOTROPIS ATHERINOIDES; PERCA FLAVESCENS; ONCORHYNCHUS TSHAWYTSCHA; ONCORHYNCHUS; INTRODUCTIONS;
2597; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

13 ASSEL, RAYMOND A.;
GREAT LAKES ICE THICKNESS PREDICTION;
(1976) JOURNAL OF GREAT LAKES RESEARCH, VOL. 2, NO. 2, PP. 246-255;
ICE; ICE CONDITIONS; ICE COVER; ICE-SNOW THICKNESS AND DENSITY; ACCUMULATION; STATISTICS; FORECASTING;
GCODE1; GCODE3; GCODE4; GCODE2; GCODE5; GCODE6; 5306;
WEEKLY ICE THICKNESS DATA, COLLECTED FROM 24 BAY, HARBOR, AND RIVER SITES ON THE GREAT LAKES, WERE CORRELATED WITH FREEZING DEGREE-DAY ACCUMULATIONS TO DEVELOP REGRESSION EQUATIONS BETWEEN ICE THICKNESS AND FREEZING DEGREE-DAYS. THE DATA BASE AT ICE MEASUREMENT SITES WAS 3 TO 6 WINTERS IN LENGTH. THE STANDARD ERROR OF ESTIMATE VARIED FOR INDIVIDUAL REGRESSION EQUATIONS AND AVERAGED BETWEEN 7 AND 8 CM FOR FIVE FORMS OF REGRESSION EQUATIONS. BECAUSE THE REGRESSION EQUATIONS ARE EMPIRICAL, THE RANGE OF INPUT DATA USED TO PREDICT ICE THICKNESS SHOULD BE LIMITED TO THE RANGE OF VALUES USED IN THE DERIVATION.;

14 ATWATER, MARSHALL A.;
THE RADIATION BUDGET OF LAKE ONTARIO;

(1974) PROCEEDINGS, 17TH CONF. GREAT LAKES RESEARCH, INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PP. 250-258;
SOLAR RADIATION; HEAT BUDGET; MATHEMATICAL MODELS;
GCODE5; 5612;
A HORIZONTAL ARRAY OF 3C GRID POINTS IS USED TO COMPUTE THE RADIATION BUDGET FOR LAKE ONTARIO DURING THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES (IFYGL). A WEIGHTED-AVERAGE ANALYSIS METHOD COMPUTES METEOROLOGICAL VARIABLES, INCLUDING CLOUD AMOUNTS, AT EACH GRID POINT FROM SURFACE OBSERVATIONS. THE RADIATION MODEL IS DESIGNED FOR ACCURACY, ECONOMY, EFFICIENCY AND THE INCLUSION OF MAJOR PHYSICAL PROCESSES THAT ALTER RADIATIVE FLUXES. DOWNWARD AND UPWARD SOLAR AND INFRARED RADIATIVE FLUXES ARE COMPUTED UTILIZING EMPIRICAL TRANSMISSION FUNCTIONS FOR ABSORBERS, SCATTERERS, AND CLOUDS. OBSERVATIONS TAKEN DURING IFYGL ARE COMPARED WITH TIME-INTEGRATED NUMERICAL RESULTS AT SELECTED SITES. THE DIFFERENCES ARE ANALYZED AND CHANGES IN THE NUMERICAL MODEL ARE DESCRIBED. RESULTS ARE PRESENTED FOR THE NET RADIATION BALANCE FOR LAKE ONTARIO DURING IFYGL AND ARE COMPARED WITH RESULTS BASED ON OBSERVATIONS.;

15 AUBERT, EUGENE J.;
THE ENERGY-RELATED GREAT LAKES RESEARCH PROGRAM OF THE DEPARTMENT OF COMMERCE;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP480-492;
ENERGY; RESEARCH; PROGRAMS; US; DEPT OF COMMERCE; METEOROLOGY; REMOTE SENSING;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

16 AUBERT, EUGENE J.;
INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP170-189;
IFYGL;
US-FCS-P1972; GCODE5;
THE IFYGL IS AN EXPERIMENTAL FIELD PROGRAM DESIGNED TO IMPROVE KNOWLEDGE OF THE LIMNOLOGY, HYDROLOGY, AND METEOROLOGY OF LAKE ONTARIO AND THE ONTARIO BASIN. THROUGH THIS IMPROVED KNOWLEDGE THE PROGRAM WILL PROVIDE A SCIENTIFIC BASIS FOR BETTER GREAT LAKES MANAGEMENT IN TERMS OF WATER QUALITY AND QUANTITY AS WELL AS ENVIRONMENTALLY SENSITIVE OPERATIONS. APPROXIMATELY 1,000 US AND CAN PARTICIPANTS FROM FEDERAL, STATE AND PROVINCIAL AGENCIES, AND UNIVERSITIES AND PRIVATE INSTITUTIONS ARE INVOLVED IN IFYGL.;

17 AULERICH, RICHARD J.; RINGER, ROBERT K.; SCHAIBLE, PHILIP J.; SEAGRAN, HARRY L.;
AN EVALUATION OF PROCESSED GREAT LAKES FISHERY PRODUCTS FOR FEEDING MINK;
(1970) FEEDSTUFFS. VOL. 42. NO. 42. P46;
FISH MEAL; ANALYSIS ; ALOSA PSEUDOHARENGUS; CATOSTOMUS; OSMERUS; FISH;
FISHERIES; ICTALURUS; CYPRINUS; FOOD;
2092; GCODEC; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5;

18 AWALD, CLIFFORD J.;
MINERALS OF THE NIAGARA FRONTIER REGION;
(1958) SCIENCE ON THE MARCH 38(5)140F,
MINERALOGY;
7616; GCODE5A; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;

19 AXTELL, HAROLD H.;
THE GEESE AT OAK ORCHARD SWAMP;
(1957) HOBBIES, 37(4)14F;
AVES; ANSERINAE; MIGRATION;
BUF-BSNS-PC6; GCODE5B4;

20 AYERS, JOHN C.;
GREAT LAKES WATERS, THEIR CIRCULATION AND PHYSICAL AND CHEMICAL CHARACTERISTICS;
(1962) AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. VOL. 71. PP71-89;
CURRENTS; VOLUME AND CURRENT FLOW; WIND; WATER; TEMPERATURE; PRECIPITATION; LAKE LEVELS; LAKES; SEICHES; ANALYSIS; TURBIDITY; SILICA; IRON; CALCIUM; MAGNESIUM; SODIUM; POTASSIUM; CARBONATE; BICARBONATE; SULFATES; NITRATE; CHLORIDE; TOTAL SOLIDS;
2569; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE CIRCULATION OF WATER IN THE GREAT LAKES INVOLVES SURFACE AND SUBSURFACE

CURRENTS, WITH A SEASONAL CYCLE OF VERTICAL CIRCULATION SUPERIMPOSED. CURRENT PATTERNS ARE DETERMINED BY WIND, FLOWTHROUGH OF DRAINAGE WATER, ROTATION OF THE EARTH, AND LOCAL INFLUENCES. SURFACE CURRENTS MAY HAVE A PRIMARY GEOSTROPHIC RELATIONSHIP TO THE DENSITY FIELD OR A SECONDARY RELATIONSHIP IN WHICH BOUNDARIES OR WIND SETUP PLAY A PART. SURFACE CURRENTS LAG BEHIND THE CAUSATIVE WIND BY PERIODS RANGING FROM TWO HOURS IN SHALLOW WATER TO A DAY IN DEEP BASINS. CURRENT PATTERNS IN DEEP BASINS APPARENTLY INVOLVE ENERGY INCREMENTS FROM WINDS OF THE PRECEDING 10 TO 12 DAYS, WITH THE INCREMENTS DECREASING EXPONENTIALLY IN EFFECTIVENESS WITH INCREASING TIME PRIOR TO THE OBSERVATION DAY. PRIMARY PHYSICAL CHARACTERISTICS OF THE LAKE WATERS ARE THEIR "SOFT-WATER" NATURE; THEIR SEASONAL CYCLES OF TURNOVER, LAKE LEVELS, AND PRECIPITATION; AND THEIR SHORT-PERIOD SEICHES. THE LAKES EXHIBIT A MODIFIED SEASONAL TURNOVER CYCLE; WIND MIXING ESTABLISHES TURNOVER AT THE END OF THE FALL COOLING PERIOD AND MAINTAINS IT THROUGHOUT THE WINTER UNTIL THE SPRING WARMING PERIOD IS ESTABLISHED. CYCLES OF LAKE LEVEL OCCUR ANNUALLY; THE LEVELS ARE LOW IN MIDWINTER AND HIGH IN MIDSUMMER. SUPERIMPOSED UPON THE ANNUAL CYCLES ARE MULTIYEAR CYCLES OF LEVEL. IN CHEMICAL CHARACTERISTICS GREAT LAKES WATERS SHOW RELATIONSHIP TO THEIR GEOLOGICAL AGES, THEIR DRAINAGE AREA ROCKS, AND TO THEIR PERIPHERAL HUMAN POPULATION DENSITIES. ONLY LAKE SUPERIOR HAS SHOWN NO CHANGE IN CHEMICAL CHARACTERISTICS IN THE PAST 50 TO 75 YEARS. LAKE ERIE, OLDEST AND MOST HEAVILY POPULATED, HAS DETERIORATED IN CHEMICAL QUALITY DURING THE PAST HUNDRED YEARS, WITH INCREASINGLY RAPID DETERIORATION IN THE LAST FIFTY YEARS;

21 BAILEY, BRUCE H.; GRAINGER, CEDRIC A.;
LAKE ONTARIO ATLAS: CLIMATOLOGY;
(1977) NY SEA GRANT INSTITUTE NYSSGP-OA-77-016, 90P;
METEOROLOGY; WIND; TEMPERATURE; SNOW; STORMS; PRECIPITATION;
US-CN-NY-OA-77-016; GCODE5;
A COMPREHENSIVE CLIMATOLOGICAL ANALYSIS OF THE LAKE ONTARIO REGION IS PRESENTED. THE ANALYSIS INCLUDES DATA TABLES AND SEVERAL DISTRIBUTION MAPS. THE REGION CONSISTS OF APPROXIMATELY 60,000 SQ KM, OF WHICH 1/4 IS OCCUPIED BY LAKE ONTARIO. THE REGION'S HIGHLY VARIABLE CLIMATE IS BASICALLY GOVERNED BY THE MID-LATITUDE QUASI-CONTINENTAL LOCATION, A HIGH FREQUENCY OF CYCLONE AND ANTICYCLONE ACTIVITY, LAKE-INDUCED INFLUENCES, VARIABLE TOPOGRAPHY, AND LOCAL URBAN EFFECTS;

22 BAILS, JACK D.;
MERCURY IN FISH IN THE GREAT LAKES;
(   ) ENVIRONMENTAL MERCURY CONTAMINATION. THE OCCURRENCE OF MERCURY. PP31-37;
MERCURY; FISH; STIZOSTEDION; PERCA FLAVESCENS; ICTALURUS; AMBLOPLITES RUPESTRIS; HEAVY METALS;
1971; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE4A; GCODE4B;

23 BALDWIN, JOHN H.; SWEENEY, ROBERT A.;
ANNOTATED BIBLIOGRAPHY OF LAKE ONTARIO LIMNOLOGICAL AND RELATED STUDIES. VOLUME III - PHYSICAL;
(1973) US EPA ECOLOGICAL RESEARCH SERIES REPORT NO EPA-R3-73-028C, PP207;
BIBLIOGRAPHY; DREDGING; WATER; POLLUTION; WATER QUALITY; THERMAL; METEOROLOGY; WASTE TREATMENT; METHODS; DATA PROCESSING; MATHEMATICAL MODELS; MEASUREMENT; SAMPLE COLLECTION; PRECIPITATION; INSTRUMENTS; DEPTH; EVAPORATION; ICE; ICE COVER; WIND; WATER LEVELS; HEAT BUDGET; TOPOGRAPHY; PHYSIOGRAPHY; PHYSICAL CHARACTERISTICS; STRATIFICATION; CURRENTS; DISCHARGE FLOW;
REF-B-US-EPA-R3-73-028C; GCODE5;
439 PAPERS CONCERNING PHYSICAL ASPECTS OF LAKE ONTARIO AND INFLUENT TRIBUTARIES WERE REVIEWED AND ABSTRACTED. EACH PAPER WAS CROSS-INDEXED BY AUTHOR, GEOGRAPHIC AREA OF LAKE AND/OR TRIBUTARY IN WHICH STUDY WAS PERFORMED, PARAMETERS, TECHNIQUES AND INSTRUMENTATION. IN ADDITION, A LIST OF ADDRESSES FOR THE AUTHORS AND AGENCIES WAS INCLUDED ALONG WITH OTHER POSSIBLY PERTINENT REFERENCES WHICH THE AUTHORS WERE NOT ABLE TO SECURE AND REVIEW WITHIN THE TIME LIMITATIONS OF THE GRANT.;

24 BALDWIN, NORMAN S.; SAALFELD, ROBERT W.;
COMMERCIAL FISH PRODUCTION IN THE GREAT LAKES 1867-1960.;
(1962) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 3.;

COMMERCIAL FISHERIES; HISTORY; FISH; STATISTICS;
GLF-TR3; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE4A2; GCODE4A3; GCODE4A5;

25 BANGAY, GARTH E.;
NON-POINT POLLUTION PROBLEMS - GREAT LAKES BASIN;
(1977) BONNER, PATRICIA A., ED., ECONOMIC AND LEGAL ENFORCEMENT MECHANISMS, PROC. OF A WORKSHOP HELD IN WINDSOR, ONTARIO, FEB.21-22, 1977. PP275-285;
WATER; POLLUTION; SEDIMENT; HEAVY METALS; PESTICIDES; RADIOACTIVITY; URBAN RUNOFF;
IJC-RA-R-77-01; GCODE3; GCODE5; GCODE6;

26 BANNERMAN, ROGER T.; ARMSTRONG, DAVID E.; HOLDREN, G. C.; HARRIS, ROBIN F.;
PHOSPHORUS MOBILITY IN LAKE ONTARIO SEDIMENTS (IFYGL);
(1974) PROC. 17TH CONF. GREAT LAKES RESEARCH. PP158-178;
SEDIMENT; PHOSPHORUS; SEDIMENTATION; DIFFUSION;
2425; GCODE5;
SEDIMENT CORES WERE OBTAINED FROM 15 LAKE STATIONS REPRESENTING THE THREE MAJOR BASINS AND THE INSHORE ZONE OF LAKE ONTARIO. CORES WERE SECTIONED FOR CHARACTERIZATION OF THE SURFACE SEDIMENTS ACCORDING TO INORGANIC P CHEMICAL MOBILITY. PHYSICAL MOBILITY WAS CHARACTERIZED BY MEASUREMENT OF P RELEASE FROM INTACT CORES INCUBATED UNDER CONTROLLED LABORATORY CONDITIONS. THE PROPORTIONS OF POTENTIALLY CHEMICALLY MOBILE INORGANIC P WERE USUALLY HIGH (30 TO 60%) IN THE CENTRAL BASIN SEDIMENTS AND LOW (2 TO 8%) FOR THE INSHORE ZONE SEDIMENTS. ALTHOUGH THE AMOUNTS OF INORGANIC P DESORBED AFTER THREE SUCCESSIVE EQUILIBRATIONS OF LAKE ONTARIO SEDIMENTS REPRESENTED ONLY 3 TO 17% OF THE POTENTIALLY MOBILE ORGANIC P, SUFFICIENT INORGANIC P WAS DESORBED TO RESTORE A LARGE PART OF THE ORIGINAL INTERSTITIAL INORGANIC P CONCENTRATIONS. INTERSTITIAL INORGANIC P (MOBILE P) CONCENTRATIONS RANGED FROM 14 TO 1280 UG/L AND WERE HIGHER THAN DISSOLVED INORGANIC P CONCENTRATIONS IN THE OVERLYING WATER. DIFFUSION RATES ESTIMATED FROM THE RANGE OF OBSERVED INTERSTITIAL INORGANIC P VALUES RANGED FROM ABOUT 0.05 TO 0.8 MG M(EXP-2) DAY (EXP-1) AND WERE IN AGREEMENT WITH THE RANGE OF 0.03 TO 0.8 MG M(EXP-2) DAY ESTIMATED FROM P RELEASE RATES FROM INTACT CORES INCUBATED UNDER CONTROLLED LABORATORY CONDITIONS. BASED ON AN INORGANIC P FLUX OF 0.2 MG M(EXP-2) DAY (EXP-1), THE ESTIMATED ANNUAL CONTRIBUTION OF INORGANIC P TO LAKE ONTARIO WATER IS EQUAL TO ABOUT 10% OF THE EXTERNAL P LOADING;

27 BARR, JOHN R.; PRINTZ, ALBERT C.;
WATER QUALITY CONTROL PRACTICES ON THE GREAT LAKES;
(1968) PROC GREAT LAKES WATER RESOURCES CONFERENCE, PP393-417;
WATER QUALITY; CONTROL; REGULATION; US; CANADA;
CAN-EIC-1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
WATER QUALITY CONTROL PRACTICES ARE CONSTANTLY BEING IMPROVED IN RESPONSE TO THE CONCERN OF THE GENERAL PUBLIC. THE RECENT ENFORCEMENT CONFERENCE ON POLLUTION OF LAKE MICHIGAN PROVIDES AN EXAMPLE OF THIS PROCESS. THE FUNDAMENTAL CHANGE VOICED BY THE CONFEREES WAS THAT HENCEFORTH A PREVENTATIVE APPROACH TO POLLUTION WOULD BE TAKEN. THIS PRINCIPLE FOUND EXPRESSION IN MANY OF THE SPECIFIC RECOMMENDATIONS OF THE CONFEREES, FOR EXAMPLE THOSE REGARDING PHOSPHORUS. ANOTHER RECENT TREND IN WATER QUALITY CONTROL HAS BEEN THE EFFORT TO ACHIEVE BETTER CO-ORDINATION BETWEEN THE SEVERAL RESPONSIBLE BRANCHES OF GOVERNMENT. THE WATER QUALITY STANDARDS PROGRAMME IS ONE SUCH EFFORT TO ACHIEVE UNIFORM LAWS. STATE LEGISLATION, SUCH AS NEW YORK'S PURE WATERS AUTHORITY ACT AND OHIO'S WATER DEVELOPMENT AUTHORITY, ALSO AIMS AT CO-ORDINATION THROUGH CREATING ONE STATEWIDE AUTHORITY TO DEAL WITH WASTE TREATMENT AND WATER MANAGEMENT, WITH POWER TO BUILD AND OPERATE WATER WORKS AND WASTE TREATMENT FACILITIES. THE PROGRAM TO CONTROL POLLUTION EMERGING FROM CURRENT CHANGES HOLDS GREAT PROMISE FOR THE PRESERVATION OF OUR WATER RESOURCES FOR FUTURE GENERATIONS.;

28 BATES, CHARLES C.;
GREAT LAKES RESEARCH FROM THE UNITED STATES COAST GUARD'S POINT OF VIEW;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP264-273;
US; COAST GUARD;
US-FCS-P1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;

29 BATES, ROBERT L.; HERDENDORF, CHARLES E.; PETTYJOHN, WAYNE A.; PRIDE, DOUGLAS E.; WITLATCH, ELBERT L., JR.;
EXTRACTIVE AREAS;
(1974) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES, 24PP;
LAND USE; WATER QUALITY; MINERALOGY; MINE WASTES; EROSION;
IJC-LW-VOL. 1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

30 BATTELLE COLUMBUS LABORATORIES;
REVIEW OF REPORTS ON LAKE ERIE - LAKE ONTARIO WATERWAY, NEW YORK. APPENDIX E: IMPACT ASSESSMENT AND ENVIRONMENTAL PLAN;
(1973) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, 173P;
PLANTS; AVES; MAMMALIA; ENDANGERED SPECIES; HYDROLOGY; ENVIRONMENT; IMPACT; PLANTS; WATER QUALITY; PHYSIOGRAPHY; ECONOMICS; RECREATION; CANALS;
US-CE-BU-RIM-E; GCODE5B2;
THIS REPORT PRESENTS THE RESULTS OF AN ENVIRONMENTAL FEASIBILITY STUDY OF THE PROPOSED LE-LO WATERWAY PROJECT. 2 OBJECTIVES WERE ASSOCIATED WITH THE RESEARCH. FIRST WAS TO PROVIDE AN OBJECTIVE ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROJECT DESIGNED TO CONNECT LAKE ERIE WITH LAKE ONTARIO. TO ACHIEVE THIS GOAL, THE BASELINE ENVIRONMENT WITHOUT THE PROJECT WAS DESCRIBED. THE CANAL PROJECT WAS THEN SUPERIMPOSED ON THIS BASELINE AND THE ENVIRONMENTAL IMPACTS WERE PREDICTED. THE IMPACTS WERE ORGANIZED INTO 4 MAJOR CATEGORIES - PHYSICAL AND CHEMICAL, SOCIOECONOMIC, ECOLOGICAL, AND RECREATIONAL AND CULTURAL - AND THE MAGNITUDE AND SIGNIFICANCE OF EACH IMPACT WAS EVALUATED. THE SECOND OBJECTIVE WAS TO DEVELOP ENVIRONMENTAL AND RECREATIONAL PLANS. THE ENVIRONMENTAL PLAN WAS DESIGNED TO REDUCE OR ELIMINATE THE ADVERSE ENVIRONMENTAL EFFECTS; THE RECREATIONAL PLAN TO CAPITALIZE ON THE RECREATIONAL POTENTIAL ASSOCIATED WITH THE PROJECT;

31 BEARDSLEE, CLARK S.; MITCHELL, HAROLD D.;
BIRDS OF THE NIAGARA FRONTIER REGION AN ANNOTATED CHECK-LIST;
(1965) BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN VOL 22, 478P;
AVES; MIGRATION; HABITAT; ABUNDANCE;
BUF-BSNS-BULL22; GCODE46; GCODE5A2, GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;

32 BEETON, ALFRED M.;
MONITORING THE QUALITY OF THE GREAT LAKES;
(1977) GIBSON-MACDONALD, NORMA, EDITOR, GREAT LAKES SURVEILLANCE AND MONITORING, IJC, P21-25;
MONITORING; WATER QUALITY; REGULATION;
IJC-WQ-P76; GCODE6;

33 BEETON, ALFRED M.;
CHEMICAL CHARACTERISTICS OF THE LAURENTIAN GREAT LAKES;
(1971) BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES. V. 25, NO. 2. PP. 1-20.;
CHEMICAL COMPOSITION; PHYSICAL CHARACTERISTICS;
BUF-BSNS-BULL-25(2); GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

34 BEETON, ALFRED M.;
EUTROPHICATION PROCESSES;
(1973) IJC PROC OF A WORKSHOP ON WATER QUALITY AND LAND USE, PP181-202;
EUTROPHICATION; NUTRIENT LOADING; NITROGEN; ALGAE; DISTRIBUTION; AMMONIA; PHOSPHATE; SILICA; ABUNDANCE; BACILLARIOPHYCEAE;
IJC-WG3; GCODE4A1T3; GCODE2; GCODE1; GCODE3; GCODE4; GCODE5; GCODE6;
LAKES IN THEIR NATURAL STATE ARE IN SOME KIND OF EQUILIBRIUM WITH THEIR WATERSHEDS. IN ORDER FOR A LAKE TO BECOME MORE EUTROPHIC, AN INCREASE IN THE NUTRIENT SUPPLY FROM THE WATERSHED WOULD HAVE TO OCCUR. EVENTS SUCH AS FOREST FIRES OR LANDSLIDES MAY ALTER THE INPUT, BUT THEN A NEW EQUILIBRIUM IS ESTABLISHED. MAN-INDUCED EUTROPHICATION IS THE RESULT OF CONTINUALLY INCREASING NUTRIENT LOADING. IN LARGE LAKES THE INSHORE ENVIRONMENTS ARE AFFECTED FIRST AND GRADUALLY THE OFFSHORE WATERS. ALL THE EVIDENCE TO DATE SHOW THAT THE INSHORE WATERS OF THE GREAT LAKES HAVE GREATER CONCENTRATIONS OF NUTRIENTS THAN THE OFFSHORE. ALGAE ARE ALSO MORE ABUNDANT INSHORE AND EUTROPHIC SPECIES ARE

IMPORTANT. DATA ON NUTRIENTS, PLANKTON, BENTHOS, AND FISH IN LAKE ERIE SHOW PROGRESSIVE CHANGES FROM SHORE LAKEWARD AND FROM WEST TO EAST.;

35 BEETON, ALFRED M.;
GREAT LAKES LIMNOLOGICAL INVESTIGATIONS;
( ) US BUREAU OF COMMERCIAL FISHERIES, PP123-126;
RESEARCH; LAKES; WATER QUALITY; FISH;
2442; GCODE1; GCODE2; GCODE3; GCODE4; GCODE6;

36 BEETON, ALFRED M.;
REPORT ON THE ENVIRONMENT AND BIOTA OF THE NIAGARA RIVER ABOVE THE AMERICAN FALLS;
(1966) AMERICAN FALLS INTERNATIONAL BOARD, 11PP;
MACROPHYTES; BENTHOS; FISH; PHYTOPLANKTON; ZOOPLANKTON; ALGAE; CLADOPHORA; NOTROPIS ATHERINOIDES; GAMMARUS; GASTROPODA; MYRIOPHYLLUM; POTAMOGETON; FUNDULUS; HABITAT;
2726; GCODE5A4T3;

37 BEETON, ALFRED M.;
STATEMENT ON POLLUTION AND EUTROPHICATION OF THE GREAT LAKES;
( ) THE LAKE ERIE INTERNATIONAL JETPORT PROJECT PRE-FEASIBILITY TECHNICAL REPORT 1971, PP11C-151;
ALGAE; PHYTOPLANKTON; FISH; ZOOPLANKTON; BENTHOS; EUTROPHICATION; WATER QUALITY; PETROMYZON MARINUS; ALOSA PSEUDOHARENGUS; HEXAGENIA; MYSIS RELICTA; PONTOPOREIA; MELOSIRA; DIAPTOMUS; EURYTEMORA; ASTERIONELLA; CYCLOTELLA; SALMO SALAR; COMMERCIAL FISHERIES; STIZOSTEDION; TOTAL DISSOLVED SOLIDS; BOSMINA; STEPHANODISCUS; APHANIZOMENON; SCHIZOTHRIX; CLADOPHORA; ABUNDANCE; COREGONUS; CHLORIDES; TOTAL NITROGEN; ORGANIC PHOSPHORUS;
2317; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

38 BEETON, ALFRED M.; TORKE, BYRON G.; BALCKS, ARTHUR S.; BOWERS, JAMES A.;
INFLUENCE OF ENERGY-RELATED EFFLUENTS ON GREAT LAKES ZOOPLANKTON;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY, PP432-437;
ZOOPLANKTON; DISTRIBUTION; COMMUNITY STRUCTURE;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

39 BELL, GERALD L.;
CHARACTERISTICS OF THE OSWEGO RIVER PLUME AND ITS INFLUENCE ON THE NEARSHORE ENVIRONMENT;
(1978) US DEPT OF COMMERCE NOAA TECHNICAL MEMORANDUM ERL GLERL-22, 74P;
PLUMES; HARBORS; SEDIMENTATION; CHEMICAL COMPOSITION; SEDIMENT;
US-CN-TM-ERL-GLERL-22; GCODE5D3T4; GCODE5D3;
ION AND SUSPENDED MATERIAL CONCENTRATIONS WERE RELATIVELY HIGH IN THE OSWEGO RIVER AS COMPARED TO LAKE ONTARIO BACKGROUND LEVELS AND GENERALLY DECREASED RAPIDLY THROUGH OSWEGO HARBOR. MOST OF THE VARIABLES MIX CONSERVATIVELY, WITH GRADIENTS SIMILAR TO THOSE OF SPECIFIC CONDUCTANCE. THERE WERE INDICATIONS OF LOADING OF NUTRIENTS, CHLORIDE, CHEMICAL OXYGEN DEMAND, AND VOLATILES OTHER THAN FROM THE RIVER. HOWEVER, OXYGEN DEPLETION WAS NOT A PROBLEM IN ANY AREA. SPECIFIC CONDUCTANCE SHOWS THAT 90% OF THE DILUTION OCCURS WITHIN 3 KM TO THE NORTHEAST AND 2 KM TO THE WEST OF THE HARBOR ENTRANCE. TRANSMISSOMETER PROFILES WERE USED TO SUPPLEMENT THE CHEMICAL AND TEMPERATURE DATA. THEY CONVENIENTLY DETAIL THE PLUME STRUCTURE. THE PREVAILING NEARSHORE CURRENT DIRECTION IS NORTHEASTWARD; HOWEVER, PERIODS OF NORTHWARD AND WESTWARD FLOWS WERE OBSERVED. PLUME CONFIGURATIONS VARIED IN RESPONSE TO STREAM FLOW, PREVAILING LONGSHORE CURRENTS, AND CURRENT VARIATIONS RELATED TO CHANGES IN WIND DIRECTION AND VELOCITY. DURING LATE SPRING AND SUMMER THE RELATIVELY WARMER PLUME TENDS TO SPREAD OVER THE COOLER LAKE WATER WITH ACCOMPANYING LAKE WATER INTRUSION OVER THE HARBOR BOTTOM, WHICH COMPLICATES SEDIMENTATION PATTERNS. IN LATE SUMMER AND FALL THE RELATIVELY COOLER RIVER WATER TENDS TO PLUNGE BENEATH THE LAKE SURFACE AT OR NEAR THE HARBOR ENTRANCE. SUSPENDED MATERIALS VARIED WITH THE RIVER FLOW. DURING LOW FLOW PERIODS THESE MATERIALS ARE DEPOSITED IN THE HARBOR ON EITHER SIDE OF THE CHANNEL AND IN THE PLUME AREA ADJACENT TO THE HARBOR. MATERIALS WITH

HIGH CONCENTRATIONS OF OIL AND GREASE AND OTHER ORGANICS EXERT A DELETERIOUS EFFECT ON THE LOCAL ENVIRONMENT, PRIMARILY THROUGH OXIDATION. DREDGING OPERATIONS RESUSPEND SOIL MATERIALS, WHICH ARE THEN REDISTRIBUTED. DREDGED SPOIL DEPOSITED OFFSHORE PRODUCES AN ADDITIONAL IMPACT ON THE DEEPER PORTION OF THE LAKE. SEDIMENTS OVERLYING BEDROCK OUTSIDE THE HARBOR WERE OFTEN LESS THAN 2.5 CM IN THICKNESS. THE COMBINED EFFECTS OF LONGSHORE AND WAVE GENERATED CURRENTS TEND TO KEEP THE MATERIALS MOVING. PARTICULATES DEPOSITED BELOW THE WAVE BASE PRIOR TO STRATIFICATION ARE ESSENTIALLY SEPARATED FROM THE EPILIMNION BY THE DEVELOPMENT OF A THERMOCLINE. MOVEMENT OF FINE PARTICULATES OVER A THERMOCLINE SURFACE PROVIDES A MECHANISM BY WHICH THESE MATERIALS ARE KEPT IN SUSPENSION AND WIDELY DISTRIBUTED;

40 BENNETT, JOHN R.;
A MODEL OF LAKE ONTARIO'S CIRCULATION;
(1977) IFYGL B NO 21, PP36-43;
MATHEMATICAL MODELS; CURRENTS; TEMPERATURE; LITERATURE REVIEW;
IFY-B21; GCODE5;

41 BENNETT, JOHN R.;
THERMALLY DRIVEN LAKE CURRENTS DURING THE SPRING AND FALL TRANSITION PERIODS;
(1971) PROC 14TH CONF GREAT LAKES RES IAGLR, PP535-544;
CURRENTS; THERMAL; MATHEMATICAL MODELS; STRATIFICATION; THERMAL BAR; MESOLIMNION; UPWELLING;
IGR-C14-1971; GCODE5;
A NUMERICAL MODEL IS USED TO STUDY THERMALLY DRIVEN LAKE CURRENTS DURING A PERIOD WHEN ONLY PART OF A LAKE IS STRATIFIED. THE MODEL PREDICTS THAT THE MOTION IS CONFINED LARGELY TO THE STRATIFIED REGION. THERE, A GEOSTROPHIC CURRENT PARALLEL TO THE SHORE IS THE DOMINANT FEATURE. A SMALLER CIRCULATION, WITH UPWELLING IN THE SHALLOW REGIONS AND A BROAD ZONE OF SINKING MOTION CENTERED ABOUT THE ISOTHERM IS FOUND TO BE IMPORTANT IN REDISTRIBUTING THE HEAT GAINED THROUGH THE SURFACE.;

42 BILLONI, MICHAEL J.;
DELAWARE PARK: REVIVING OLMSTED'S VISION;
(1979) COURIER-EXPRESS SUNDAY APRIL 1, 1979, PP16-21;
BUFFALO; NY, RECREATION;
7906; GCODE5A4T3S1;

43 BLANTON, JACKSON O.;
CHARACTERISTICS OF NEARSHORE CIRCULATION AFFECTING THE TRANSPORT OF DISSOLVED AND SUSPENDED MATERIALS;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP336-350;
STRATIFICATION; TRANSPORT; CURRENTS; LITTORAL; DYE PATTERNS ; COASTAL ZONE;
US-FCS-F1975; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C3; GCODE5C5; GCODE5D3; GCODE5D4; GCODE5D5;
DETAILS OF THE CIRCULATION IN THE NEARSHORE ZONE ARE ONLY NOW EMERGING, AS THE INSTITUTIONS DEPLOY CLOSELY-SPACED RECORDING CURRENT METERS FOR SEVERAL WEEKS AT A TIME. THESE STUDIES HAVE BEEN COMPLEMENTED BY COASTAL CHAIN AND DYE DIFFUSION EXPERIMENTS. A PROGRESSIVE VECTOR DIAGRAM FOR CURRENTS IN LAKE ONTARIO CAN ILLUSTRATE ESSENTIAL DIFFERENCES BETWEEN NEARSHORE CURRENTS AND THOSE FARTHER FROM SHORE. THE STRATIFICATION SEASON OF THE GREAT LAKES IS CHARACTERIZED BY FREQUENT UPWELLING AND DOWNWELLING OF THE NEARSHORE THERMOCLINE. MOST OF THE VARIANCE OF CURRENTS IN THE NEARSHORE ZONES OCCURS DURING A PERIOD OF 3 DAYS OR MORE, AND THE ACCELERATED RATE OF DISPERSION OF DYE PLUMES IN SHIFTING OR REVERSING CURRENTS HAS BEEN DOCUMENTED. FOR POLLUTANTS, SEDIMENTS, AND OTHER FLOATABLES, A DIRECT CONTRIBUTION CAN BE MADE AS TO HOW THE TRANSITION ZONE AFFECTS TRANSPORT.;

44 BLANTON, JACKSON O.; MURTHY, C. RAJ;
OBSERVATIONS OF LATERAL SHEAR IN THE NEARSHORE ZONE OF A GREAT LAKE;
(1974) J PHYSICAL OCEANOGRAPHY, 4(4):660-663;
CURRENTS; COASTAL ZONE; WIND;
CAN-CCIW-CR-7; GCODE5;
OBSERVATIONS OF CURRENTS ACROSS A NEARSHORE ZONE FROM 2 TO 6 KM OFFSHORE

INDICATE THAT UNSTEADY LONGSHORE FLOW AND COMPLETE REVERSALS IN FLOW ARE USUALLY ACCOMPANIED BY LARGE VALUES OF LATERAL SHEAR. THESE VALUES OFTEN APPROACH AND MAY EXCEED 10(EXP-4) SEC(EXP-1), NEAR THE VALUE OF THE CORIOLIS PARAMETER AT MID-LATITUDE. AT TIMES WHEN LATERAL SHEAR IS HIGH, OTHER TURBULENT PROPERTIES SUCH AS VARIANCE AT A POINT ARE ALSO HIGH. THE VARIATIONS OF LATERAL SHEAR ARE HIGHLY TEMPORAL AND CAN BE QUALITATIVELY RELATED TO THE CYCLES OF CYCLONE-ANTICYCLONE ACTIVITY IN THE AREA. HIGH SHEAR VALUES USUALLY DO NOT COINCIDE WITH HIGH WINDS, BUT ARE USUALLY RELATED TO THE INABILITY OF THE NEARSHORE CURRENTS TO ADJUST TO A SLOWLY VARYING WIND REGIME. SIMPLE MOMENTUM ARGUMENTS SUGGEST THAT THE TIME FOR ADJUSTMENT DECREASES AS WATER DEPTH NEARSHORE DECREASES;

45 BLUM, JOHN L.;
ZYGNEMATACEAE OF WESTERN NEW YORK. I;
(1956) PAPERS OF THE MICHIGAN ACADEMY OF SCIENCE, ARTS, AND LETTERS. VOL. 41, PP. 3-15.;
ALGAE; ZYGNEMATACEAE; NY; CHLOROPHYTA; SPIROGYRA; IDENTIFICATION;
6489; GCODE5A413S1; GCODE5A413S2; GCODE4G513S1;

46 BOCSOR, J. GEORGE;
SEASONAL AND VERTICAL DISTRIBUTION OF ZOOPLANKTON IN LITTLE SODUS BAY;
(1974) RICE CREEK BIOLOGICAL FIELD STATION BULLETIN, 1(1):66-74;
ZOOPLANKTON; DISTRIBUTION;
NY-UOS-B1974-1; GCODE5D3;

47 BOLSENGA, STANLEY J.;
TOTAL ALBEDO OF GREAT LAKES ICE;
(1969) WATER RESOURCES RESEARCH. VOL. 5. NO. 5. PP1132-1133;
ICE - SNOW PHYSICAL PROPERTIES;
1481; GCODE;
THE TOTAL ALBEDO OF VARIOUS TYPES OF ICE COMMON TO THE GREAT LAKES RANGED FROM 10% FOR CLEAR ICE TO 46% FOR SNOW ICE AT SOLAR ALTITUDES RANGING FROM 32 TO 46 DEGREES. EXPLANATIONS ARE GIVEN FOR SIMILARITIES BETWEEN THE ALBEDO OF PANCAKE (31%) AND SLUSH CURD ICE (32%), AND SLUSH (41%) AND BRASH ICE (41%);

48 BOLSENGA, STANLEY J.; HAGMAN, JOHN C.;
ON THE SELECTION OF REPRESENTATIVE STATIONS FOR THIESSEN POLYGON NETWORKS TO ESTIMATE LAKE ONTARIO OVERWATER PRECIPITATION;
(1975) IFYGL B NO 16, PP57-62;
PRECIPITATION; FORECASTING; METHODS;
IFY-B16; GCODE5;

49 BONHAM-CARTER, GRAEME; THOMAS, JOHN H.,
NUMERICAL CALCULATION OF STEADY WIND-DRIVEN CURRENTS IN LAKE ONTARIO AND THE ROCHESTER EMBAYMENT;
(1973) PROCEEDINGS, 16TH CONFERENCE ON GREAT LAKES RESEARCH, INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PP. 640-662;
MODEL STUDIES; CURRENTS; WIND; MATHEMATICAL MODELS;
GCODE5; GCODE5C2; GCODE5C5; 5G66;
A NUMERICAL MODEL BASED ON SHALLOW-LAKE THEORY IS USED TO PREDICT THE THREE-DIMENSIONAL PATTERN OF STEADY WIND-DRIVEN CURRENTS IN LAKE ONTARIO, AND IN PARTICULAR IN THE ROCHESTER EMBAYMENT UNDER WINTER CONDITIONS. THE SHALLOW-LAKE THEORY IS VALID BOTH IN NEARSHORE REGIONS, SUCH AS THE ROCHESTER EMBAYMENT, AND IN THE DEEP CENTRAL PORTION OF THE LAKE. THE MODEL PREDICTS THE FULL THREE-DIMENSIONAL VELOCITY FIELD, WHICH IS INDISPENSIBLE IN CONSIDERING MASS TRANSPORT. IN DEEP WATER, THE RESULTS ARE IN CLOSE AGREEMENT WITH RESULTS OF MODELS BASED ENTIRELY ON THE VERTICALLY INTEGRATED EQUATIONS OF MOTION. FOR THE PREVAILING WIND OUT OF THE WEST, THE STRONGEST CURRENTS ARE CONCENTRATED IN COASTAL JETS FLOWING WEST TO EAST ALONG THE NORTH AND SOUTH SHORES OF THE LAKE. THE SOUTHERN COASTAL JET FOLLOWS THE SHORELINE IN THE EMBAYMENT WITH CONSIDERABLE SPREADING IN CROSS-SECTIONAL AREA. RETURN FLOW TO THE WEST OCCURS IN THE CENTRAL PART OF THE LAKE FROM 20 M BELOW THE SURFACE TO THE BOTTOM. THE PATTERN OF VERTICAL VELOCITIES SHOWS THE STRONGEST UPWELLING ALONG THE NORTHEAST SHORE WITH DOWNWELLING OCCURRING ALONG THE SOUTHERN SHORE; IN THE EMBAYMENT THE

STRONGEST DOWNWELLING OCCURS ABOUT 10 KM FROM SHORE. A MORE COMPLICATED PATTERN IS PREDICTED FOR WIND OUT OF THE SOUTH. CURRENT MAGNITUDES ARE SIMILAR TO THOSE FOR A WEST WIND NEAR THE SURFACE. FOR THE SOUTH WIND, HOWEVER, CURRENT MAGNITUDES DROP OFF RAPIDLY WITH INCREASING DEPTH AND THE TOTAL VOLUME TRANSPORT IS SMALLER. DISTINCTIVE GYRES OCCUR AT THE NORTHEASTERN AND SOUTHWESTERN CORNERS OF THE LAKE AT 20-40 M BELOW THE SURFACE. IN THE EMBAYMENT, RELATIVELY STRONG UPWELLING OCCURS ABOUT 10 KM FROM SHORE AND BELOW 20 M VELOCITIES INDICATE WATER MOVEMENT INTO THE EMBAYMENT. RESULTS ARE IN REASONABLE AGREEMENT WITH THE LIMITED WINTERTIME CURRENT DATA AVAILABLE AND THE OBSERVED BEHAVIOR OF THE GENESEE RIVER PLUME FOR WEST AND SOUTH WINDS MAY BE ROUGHLY PREDICTED FROM THE MODEL.;

50 BOREMAN, JOHN G., ED;
GREAT LAKES FISH EGG AND LARVAE IDENTIFICATION: PROCEEDINGS OF A WORKSHOP;
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TAXONOMY; FISH; EGGS; LARVAE; SPECIES DIVERSITY; IDENTIFICATION; RESEARCH; NUCLEAR POWER GENERATING STATIONS; BIBLIOGRAPHY;
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7937; GCODE5;
THE ELECTRON TRANSPORT SYSTEM (ETS) ACTIVITY IN MYSIS RELICTA, LIMNOCALANUS MACRURUS, AND SURFACE ZOOPLANKTON WAS MEASURED BY FOLLOWING THE RATE OF REDUCTION OF CYTOCHROME C IN THE PRESENCE OF NADH, SUCCINATE, OR NADPH. THE STEADY-STATE KINETICS INDICATE THAT NADPH IS OXIDIZED BY A DIFFERENT ETS FROM NADH AND SUCCINATE, AND MORE THAN ONE SYSTEM MAY EXIST FOR THE OXIDATION OF NADH AND SUCCINATE IN SURFACE ZOOPLANKTON. THE NADPH REQUIRING ETS WHICH, BECAUSE OF THE HIGHER MICHAELIS-MENTEN CONSTANT, PRESUMABLY DOES NOT REDUCE CYTOCHROME C IN VIVO, IS PROBABLY EQUIVALENT TO THE MICROSOMAL NADPH-REQUIRING ETS FROM VERTEBRATES AND INSECTS USED IN THE DETOXIFICATION OF ORGANIC COMPOUNDS. ETS ACTIVITY IS AFFECTED BY BOTH ENVIRONMENTAL TEMPERATURE AND SIZE OF THE ORGANISM, WITH ENVIRONMENTAL TEMPERATURE AFFECTING BOTH THE TOTAL ACTIVITY OF THE ENTHALPY OF ACTIVATION OF THE SYSTEM .LARGER ORGANISMS HAVE A LOWER ACTIVITY PER UNIT WEIGHT COMPARED WITH SMALLER ANIMALS. BECAUSE THE EFFECTS OF TEMPERATURE AND SIZE ARE ROUGHLY SIMILAR FOR NADPH OXIDATION AND NADH OR SUCCINATE OXIDATION, THE RATIO OF NADPH TO EITHER NADH OR SUCCINATE OXIDATION MAY BE A USEFUL INDICATOR OF EXPOSURE TO TOXIC ORGANIC COMPOUNDS.;

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GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; 5053;

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IJC-RC3; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
FOLLOWING A BRIEF DISCUSSION OF A LARGE LAKE'S RESPONSES TO METEOROLOGICAL FORCING, THE COASTAL BOUNDARY LAYER IS DESCRIBED. THE PROCESS OF TURBULENT DIFFUSION IS OUTLINED FROM BOTH THEORETICAL AND EXPERIMENTAL POINTS OF VIEW AND IS DESCRIBED IN TERMS OF LAKE DYNAMICS FROM LOCAL TO BASIN WIDE SCALES.;

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US-FCS-F1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE US GEOLOGICAL SURVEY CAME INTO BEING BY CONGRESSIONAL ACT ON MARCH 3, 1879, WITH RESPONSIBILITY FOR CLASSIFYING THE PUBLIC LANDS AND EXAMINING THEIR GEOLOGIC STRUCTURE AND MINERAL RESOURCES. UNDER THIS BROAD CHARTER THE SURVEY'S WORK NOW APPROACHES THE FIRST CENTURY MARK WITH RAPIDLY EXPANDING COVERAGE ON MINERAL RESOURCES, TOPOGRAPHY, SURFACE AND SUBSURFACE GEOLOGY, AND WATER RESOURCES. IN THE GREAT LAKES BASIN THE SURVEY HAS MAPPED ABOUT 90% OF THE AREA IN STANDARD 3 1/2 OR 15-MINUTE TOPOGRAPHIC QUADRANGLE FORMATS. MAPPING OF THE REMAINING IS EXPECTED TO BE COMPLETED BY 1975. THE SURVEY CONTINUES ITS ASSESSMENT OF THE SURFACE AND UNDERGROUND WATER RESOURCES. KNOWLEDGE AND INVESTIGATIVE CAPABILITIES APPLICABLE TO A HOST OF HYDROLOGIC PROBLEMS FLOW FROM THE RESEARCH PROGRAM.;

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NEW YORK STATE HAS WORKED DILIGENTLY DURING THE PAST 6 YEARS TO PLAN AND ESTABLISH A SALMONID SPORT FISHERY ON LAKES ERIE AND ONTARIO THAT WOULD PROVIDE THE KIND OF RECREATIONAL OPPORTUNITIES ENJOYED BY UPPER GREAT LAKES RESIDENTS ON LAKE MICHIGAN, AND ONE THAT WOULD HAVE SIMILAR POSITIVE ECONOMIC IMPACTS ON COASTAL COMMUNITIES. ALTHOUGH NEW YORK'S GREAT LAKES SALMONID FISHERIES ARE STILL IN THEIR DEVELOPMENTAL STAGES, THESE FISHERIES HAVE BEEN POPULAR WITH THE

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IGR-C7-1964; GCODE4; GCODE5;
A STUDY OF THE HYDROLOGIC CHARACTERISTICS OF THE ERIE AND ONTARIO BASINS INDICATES SIGNIFICANT DIFFERENCES. IN THE ERIE BASIN ONLY ABOUT 1/3 OF THE PRECIPITATION BECOMES STREAMFLOW - APPARENTLY THE LOWEST PROPORTION FOR ANY OF THE GREAT LAKES BASINS. IN THE ONTARIO BASIN THE STREAMFLOW IS EQUIVALENT TO APPROXIMATELY 1/2 OF THE PRECIPITATION. IT APPEARS THAT FACTORS OTHER THAN CLIMATE ARE RESPONSIBLE FOR THESE DIFFERENCES IN HYDROLOGIC CHARACTERISTICS. THERE IS A LARGE VARIATION AMONG THE VARIOUS RIVER BASINS WHICH DRAIN INTO ERIE AND ONTARIO, AND ALSO IN THE MONTHS OF THE YEAR, IN THE PERCENTAGE OF THE PRECIPITATION WHICH FLOWS INTO THE LAKES. THE MONTHLY EXTREMES FOR ERIE RANGE FROM 75% IN MARCH TO ONLY 6% IN SEPTEMBER. FOR ONTARIO THE VALUES ARE 11% IN APRIL AND 17% IN AUGUST. THE WATER AREA OF LAKE ERIE MAKES LITTLE CONTRIBUTION TO THE TOTAL WATER SUPPLY OF THE GREAT LAKES, BECAUSE THE AVERAGE ANNUAL EVAPORATION OF APPROXIMATELY 34 IN IS ABOUT THE SAME AS THE AVERAGE ANNUAL PRECIPITATION ON THE WATER SURFACE OF THE LAKE. THE AVERAGE MONTHLY EVAPORATION FROM LAKE ERIE IS LARGEST IN OCTOBER - ABOUT 6 1/2 IN. FOR LAKE ONTARIO, THE APPARENT AVERAGE ANNUAL EVAPORATION IS BETWEEN 29 AND 30 IN;

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SALT USED FOR DEICING THE STREETS NEAR ROCHESTER, NEW YORK, HAS INCREASED THE CHLORIDE CONCENTRATION IN IRONDEQUOIT BAY AT LEAST FIVEFOLD DURING THE PAST TWO DECADES. DURING THE WINTER OF 1969-70 THE QUANTITY AND SALINITY OF THE DENSE RUNOFF THAT ACCUMULATED ON THE BOTTOM OF THE BAY WAS SUFFICIENT TO PREVENT COMPLETE VERTICAL MIXING OF THE BAY DURING THE SPRING. COMPARISON WITH 1939 CONDITIONS INDICATES THAT THE PERIOD OF SUMMER STRATIFICATION HAS BEEN PROLONGED A MONTH BY THE DENSITY GRADIENT IMPOSED BY THE SALT RUNOFF;

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POPULATION;
US-CS-MI-TR42; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE MAINTENANCE AND IMPROVEMENT OF WATER AND SHORELINE QUALITY ULTIMATELY
REQUIRES THAT THE VARIOUS GOVERNMENTAL UNITS RESPONSIBLE FOR QUALITY BE ABLE TO
PERCEIVE THE NATURE OF FACTORS INFLUENCING WATER AND SHORELINE QUALITY, AND THE
CAUSE AND EFFECT RELATIONSHIPS AMONG THESE FACTORS. A QUESTIONNAIRE SURVEY
CONDUCTED AMONG 650 GOVERNMENTAL UNITS IN THE GREAT LAKES AREA HAS IDENTIFIED
THE LEVELS OF WATER QUALITY IN THE RESPECTIVE AREAS, THE PERCEIVED FACTORS
CONTRIBUTING TO THE DESTRUCTION OF WATER RESOURCES AND POSSIBLE SOLUTIONS TO THE
PROBLEM OF DETERIORATING WATER QUALITY. ONE-WAY FREQUENCY DISTRIBUTIONS
OBTAINED, BASED ON THE 300 RESPONSES TO THE QUESTIONNAIRES, INDICATE THAT THE
WATER QUALITY IS MEDIUM OR LOWER IN 92% OF THE CASES, WHILE IT IS LOW OR VERY
LOW IN 35% OF THE CASES. INADEQUATE MUNICIPAL SEWAGE TREATMENT AND INADEQUATE
INDUSTRIAL EFFLUENT TREATMENT WERE IDENTIFIED TO BE THE MOST COMMON FACTORS
CAUSING THE DESTRUCTION OF WATER RESOURCES. THE PRIMARY AGENCIES RESPONSIBLE FOR
THE MAINTENANCE OF WATER QUALITY IN THE LOCAL AREAS WERE REPORTED TO BE THE
STATE AND PROVINCIAL AGENCIES. ANALYSIS OF 2-VARIABLE RELATIONSHIPS HAVE BEEN
MADE WITH A VIEW TO LINK THE CHAIN OF CAUSAL FACTORS INFLUENCING WATER IN THE
GREAT LAKES. WATER QUALITY IS FOUND TO VARY WITH THE TYPE OF LAND USE AND
POPULATION DENSITY, DECREASING WITH INCREASING DEGREE OF INDUSTRIALIZATION AND
DECREASING WITH INCREASING POPULATION DENSITY. A CAUSAL SEQUENCE MODEL IN WHICH
POPULATION DENSITY APPEARS AS THE INTERVENING VARIABLE BETWEEN LAND USE AND
WATER QUALITY IS PROPOSED, AND THIS SEEMS TO CORRELATE WITH THE DATA;

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DEPTH PROFILES OF CALM WATER SETTLING VELOCITIES WERE MEASURED IN SITU USING
SPECIALLY CONSTRUCTED SAMPLING BOTTLES. SAMPLES WERE TAKEN AT SPECIFIC DEPTHS
AND THE SETTLING PROCESS COMMENCED AS SOON AS THE SAMPLES WERE TAKEN. JUST
BEFORE RETRIEVAL OF THE BOTTLES, THE SAMPLES WERE SUBDIVIDED INTO UPPER AND
LOWER PORTIONS SO THAT SETTLING VELOCITIES COULD BE CALCULATED; THESE VARIED
BETWEEN -0.4 AND +2.0 M/DAY. NET SETTLING VELOCITIES MEASURED AT THE TOP OF THE
THERMOCLINE WERE USED TO ESTIMATE NET SETTLING FLUXES FROM THE EPILIMNION, THESE
VARIED BETWEEN -0.074 AND +0.330 MOLES OF PHOSPHORUS/SQUARE METERS/DAY. NET
SETTLING FLUX CAN DIFFER FROM SEDIMENTATION FLUX OUT OF THE EPILIMNION AND THE
NECESSITY FOR A CLEAR DISTINCTION BETWEEN THESE TWO VALUES IS EMPHASIZED.;

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STRATIGRAPHIC GEOLOGY; PALEONTOLOGY; DRAINAGE SYSTEMS; GEOLOGY; NY; ZOOPLANKTON;
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7914; GCODE5A4T5;
THE MODERN NIAGARA RIVER WAS INITIATED AS A MULTI-OUTLET RIVER-LAKE SYSTEM
FOLLOWING THE LAST ICE RETREAT FROM THE AREA ABOUT 12,300 YR BP. THIS SYSTEM
EXTENDED FROM EARLY LAKE ERIE IN THE CONTEMPORANEOUSLY FORMED GLACIAL LAKE
IROQUOIS IN THE ONTARIO BASIN. THE LAST MAJOR ICE ADVANCE AND ONE SUBSEQUENT
GLACIAL OSCILLATION ASSOCIATED WITH THE ICE RETREAT ARE RECORDED IN SEQUENCES OF
GLACIOLACUSTRINE DEPOSITS AND TILL ALONG THE PRESENT GORGE WALL AND WITHIN OLDER
BEDROCK SPILLWAYS. DATED WOOD OVERLYING IROQUOIS SILTS AND TILL WITHIN THE
LOCKPORT SPILLWAY, EAST OF NIAGARA, SUGGEST THAT THE MULTI-OUTLET (LAKE
TONAWANDA) PHASE OF THE DRAINAGE CEASED ABOUT 10,.000 YR BP WITH CONCENTRATION
OF THE OUTFLOW, AND HENCE MAJOR GORGE RECESSION, AT LEWISTON. RADIOCARBON
ANALYSIS OF MOLLUSKS FROM RIVER GRAVELS AT THE TOP OF THE NIAGARA GORGE AT
WHIRLPOOL PARK INDICATE THAT CATARACT RECESSION FROM LEWISTON TO THIS SITE OF
INTERSECTION WITH THE MUCH OLDER BURIED ST. DAVIDS GORGE OCCURRED AFTER 9800 YR
BP. LAKE TONAWANDA PERSISTED NEAR THE PRESENT SITE OF NIAGARA FALLS UNTIL ABOUT
1,000 YR AGO; HOWEVER, DATED MOLLUSKS IMPLY THAT DEPOSITION HERE WAS INTERRUPTED
BY INTENSE SCOURING SHORTLY BEFORE 3800 YR BP., WHICH MAY HAVE BEEN A RESPONSE
TO THE CLOSING NORTH BAY OUTLET OF THE UPPER GREAT LAKES AND CONSEQUENT LARGE
INCREASE IN DISCHARGE THROUGH LAKE ERIE. MOLLUSKS WHICH OCCUR IN THE ANCIENT
NIAGARA RIVER GRAVELS ARE WELL PRESERVED AND DISTINCTLY ZONED. THE LAKE
TONAWANDA FAUNA, HERETOFORE UNDESCRIBED, INCLUDES ABOUT 15 SPECIES, ALL OF WHICH
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IRON; MANGANESE; HEAVY METALS; BARIUM; ARSENIC; GEOMORPHOLOGY; SEDIMENTATION;
1906; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
FERROMANGANESE NODULES OCCUR IN ALL OF THE ST. LAWRENCE GREAT LAKES WITH THE
GREATEST DEPOSITS FOUND TO DATE IN NORTHERN LAKE MICHIGAN. THE LAKE MICHIGAN
NODULES AVERAGE 20% IRON AND 6% MANGANESE AND OCCUR AS SEVERAL TYPES BASED UPON
PHYSICAL AND CHEMICAL PROPERTIES. NODULES OCCUR AS CONCRETIONARY MATERIAL AROUND
A QUARTZ OR FELDSPAR NUCLEUS AND FERROMANGANESE OXIDE COATINGS ON SAND GRAINS
WHICH ARE AGGLUTINATED INTO MASSES USUALLY LESS THAN 3 MM IN DIAMETER.
CHEMICALLY, THE NODULES CONSIST OF REDDISH BROWN HIGH IRON-LOW MANGANESE
MATERIAL, AND DARK BROWN HIGH MANGANESE-LOW IRON MASSES. THE TRACE ELEMENT
CONTENT OF NODULES IS 1 TO 2 ORDERS OF MAGNITUDE LOWER THAN MARINE MATERIAL.
LAKE MICHIGAN NODULES CONTAIN UNUSUALLY HIGH CONCENTRATIONS OF BARIUM AND
ARSENIC WHICH APPEAR TO BE ASSOCIATED WITH HYDROUS MANGANESE OXIDE.
RECONNAISSANCE SAMPLING OF THE UPPER GREAT LAKES REVEALED THE PRESENCE OF

NODULES AT MANY LOCALITIES EXHIBITING A SIMILAR GEOLOGIC ENVIRONMENT. NODULES ALWAYS OCCUR IN OXIDIZED SANDS THAT OVERLAY STIFF RED AND GRAY LACUSTRINE CLAYS. THE NODULES ARE EXTREMELY SENSITIVE TO OXIDATION-REDUCTION POTENTIAL AND SELDOM OCCUR IN MILDLY OXIDIZING SEDIMENTS. IN CONJUNCTION WITH REDOX POTENTIAL, SEDIMENTATION RATES ARE THE OTHER IMPORTANT FACTOR AFFECTING THE PRESERVATION OF FERROMANGANESE NODULES. SYNTHESIS OF GEOLOGICAL AND GEOCHEMICAL DATA PERMIT THE EVALUATION OF SEVERAL PARAMETERS THAT MAY BE USEFUL IN EXPLORATION FOR FERROMANGANESE DEPOSITS IN THE GREAT LAKES;

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(1973) NY STATE SEA GRANT PROGRAM, GREAT LAKES MANAGEMENT PROBLEMS SERIES, PP264;
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US-CS-NY-C7; GCODE5;
A HUGE RESOURCE SHARED BY THE US AND CANADA, THE GREAT LAKES, IS BEING USED BY AMERICANS AND CANADIANS ALIKE IN AN INTENSIVE WAY. THE PURPOSE OF THIS PAPER IS TO LOOK AT AND REPORT ON 3 MAJOR USES OF A PORTION OF THAT NATURAL RESOURCE SYSTEM, THE LAKE ONTARIO BASIN. THE REPORT BEGINS WITH A BRIEF DESCRIPTION OF THE CHARACTERISTICS OF THE BASIN. THE REPORT CONSISTS OF 3 PARTS WHICH DEAL WITH THE FISHERY, OUTDOOR RECREATION AND WILDLIFE, IN THAT ORDER. THE PHYSICAL BOUNDARIES OF THE STUDY AREA INCLUDE THE ENTIRE LAKE DRAINAGE BASIN EXCEPT FOR THE NIAGARA RIVER INFLOW. IN THE ANALYSIS OF THE SPORT FISHERY, OUTDOOR RECREATION AND WILDLIFE, THESE BOUNDARIES ARE EXTENDED ALONG THE ST. LAWRENCE RIVER TO CORNWALL, ONTARIO BECAUSE OF THE EXTENSIVE RECREATIONAL USE OF THAT REGION.;

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THE ROLE OF THE INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH IN RESEARCH OF THE GREAT LAKES;
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SLE-TR3; GCODE5D4; GCODE5D5; GCODE7;

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COMPREHENSIVE IFYGL MATERIALS BALANCE STUDY FOR LAKE ONTARIO;
(1977) US EPA, PART 1, 286P; PART II, 527P; PART III, 456P;
NUTRIENT LOADING; CHEMICAL COMPOSITION; PHOSPHATE; NITRATE; NITRITE; AMMONIA; KJELDAHL NITROGEN; ORGANIC NITROGEN; TOTAL NITROGEN; TOTAL ORGANIC CARBON; SILICA; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; SULFATE; CHLORIDE; FLUORIDE; MANGANESE; IRON; NICKEL; COPPER; ZINC; LEAD; CADMIUM; PH; DISSOLVED OXYGEN; ALKALINITY; CHLORIDE; MERCURY;
GCODE5; GCODE5A413; GCODE5C215; GCODE5D314; GCODE5D4T1; GCODE7;

82 CASEY, DONALD J.; SALBACH, STEVEN E.;

IFYGL STREAM MATERIALS BALANCE STUDY (IFYGL);
(1974) PROC 17TH CONF GREAT LAKES RES, P666-681;
PHOSPHORUS LOADING; NUTRIENT LOADING; PHOSPHORUS; RIVERS ; MATHEMATICAL
MODELS; TOTAL NITROGEN; CHLORIDES; SAMPLE COLLECTION;
IGR-C17-1974; GCODE5;
THE OBJECT OF THIS PAPER IS TO REPORT ON THE RESULTS OF STUDIES CONDUCTED AS PART OF IFYGL BY THE US EPA AND THE OME TO DETERMINE THE AMOUNT OF MATERIALS ENTERING AND LEAVING LAKE ONTARIO. OWING TO BUDGET CONSIDERATIONS AND HYDROLOGIC DIFFERENCES, THE CANADIAN AND US PROGRAMS DIFFERED IN REGARD TO THE FREQUENCY OF STREAM SAMPLING AND TO SOME EXTENT, IN REGARD TO PARAMETERS MEASURED. THE PAPER ADDRESSES MEAN ANNUAL LOADINGS TO LAKE ONTARIO FOR TOTAL PHOSPHORUS, SOLUBLE PHOSPHORUS, AMMONIA, TOTAL NITROGEN, NITRATE, SULFATE AND VARIOUS METALS. A MATERIALS BALANCE BUDGET FOR TOTAL PHOSPHORUS, TOTAL NITROGEN, AND CHLORIDE FOR LAKE ONTARIO HAS BEEN CALCULATED AND IS REFERRED TO. THE PROBLEM OF DETERMINING WHAT FREQUENCY OF STREAM SAMPLING WOULD PRODUCE THE BEST RESULTS IS ALSO REFERRED TO;

83 CHAN, K. CHENG H.;
WATER QUALITY SURVEYS ON THE NIAGARA RIVER - 1974;
(1977) CANADA ENVIRONMENT WATER QUALITY BRANCH REPORT SERIES NO 46, PP9;
WATER QUALITY; HEAVY METALS; ANALYSIS; NUTRIENTS; NTA; PCB; PHOSPHORUS LOADING; CHEMICAL LOADING; NUTRIENT LOADING;
CAN-EN36-502/46; GCODE5A413;
FIVE WATER QUALITY SURVEYS WERE CARRIED OUT FROM JULY TO DEC OF 1974 AT NIAGARA-ON-THE-LAKE TO EXAMINE THE CROSS-SECTIONAL, DOWNSTREAM AND SEASONAL VARIATION OF THE WATER CHEMISTRY OF THE MOUTH OF THE NIAGARA RIVER. SIXTEEN SURFACE WATER SAMPLES WERE COLLECTED FOR 3 CONSECUTIVE DAYS ON EACH SURVEY. THE WATER SAMPLES WERE ANALYZED FOR NUTRIENTS, DISSOLVED MAJOR IONS, HEAVY METALS AND ORGANIC CONTAMINANTS. VARIANCE ANALYSIS OF THE RESULTS INDICATES THAT THERE IS NO LATERAL OR CROSS-SECTIONAL VARIATION IN THE WATER CHEMISTRY AND THAT THE VARIABILITY IN THE WATER QUALITY OF THE NIAGARA RIVER IS BOTH PARAMETER AND SEASON DEPENDENT;

84 CHAPRA, STEVEN C.; ROBERTSON, ANDREW;
GREAT LAKES EUTROPHICATION: THE EFFECT OF POINT SOURCE CONTROL OF TOTAL PHOSPHORUS;
(1977) SCIENCE, VOL. 196, PP. 1448-1450;
MATHEMATICAL MODELS; MODEL STUDIES; PHOSPHORUS;
GCODE1; GCODE2; GCODE3; GCODE4, GCODE5; GCODE6; GCODE262; GCODE3C2; 4740;
A MATHEMATICAL MODEL OF THE GREAT LAKES TOTAL PHOSPHORUS BUDGETS INDICATES THAT A 1 MILLIGRAM PER LITER EFFLUENT RESTRICTION FOR POINT SOURCES WOULD RESULT IN SIGNIFICANT IMPROVEMENT IN THE TROPHIC STATUS OF MOST OF THE SYSTEM. HOWEVER, BECAUSE LARGE AREAS OF THEIR DRAINAGE BASINS ARE DEVOTED TO AGRICULTURE OR ARE URBANIZED, WESTERN LAKE ERIE, LOWER GREEN BAY, AND SAGINAW BAY MAY REQUIRE NON-POINT SOURCE CONTROLS TO EFFECT SIGNIFICANT IMPROVEMENTS IN THEIR TROPHIC STATUS.;

85 CHARLIER, ROGER H.;
POLLUTION, OCEANOLOGY, AND LIMNOLOGY IN THE GREAT LAKES;
(1970) MTS JOURNAL. VOL. 4. NO. 5. PP59-66;
POLLUTION; RESEARCH; EDUCATION;
2444; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
REGULATORY AGENCY;

86 CHAU, YIU K.; SAITOH, HIROHUMI;
MERCURY IN THE INTERNATIONAL GREAT LAKES;
(1973) PROC 16TH CONF GREAT LAKES RES, P221-232;
MERCURY; WATER; SEDIMENT; DISTRIBUTION;
IGR-C16-1973; 7249; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE TOTAL MERCURY DATA OBTAINED FROM MONITORING CRUISES DURING THE PERIOD 1970-1971 ON THE FOUR INTERNATIONAL GREAT LAKES WERE EXAMINED TO ASSESS THE MERCURY LEVEL IN THESE LAKES AND TO ESTABLISH BASELINE VALUES FOR FUTURE REFERENCE. THE MERCURY LEVELS IN EACH OF THE 4 GREAT LAKES ARE VERY SIMILAR TO ONE ANOTHER. MEAN VALUES VARY FROM 0.13 UG/L FOR LAKE ONTARIO TO 0.16 UG/L FOR

LAKE SUPERIOR. SIGNIFICANT AMOUNTS OF THE MERCURY ARE NOT DITHIZONE-CHLOROFORM-EXTRACTABLE WHICH SUGGESTS THAT THEY ARE STRONGLY ASSOCIATED WITH THE PARTICULATE MATTER. AN OXIDATION STEP IS NECESSARY TO BREAK DOWN THIS FRACTION FOR TOTAL MERCURY ANALYSIS. FORMS OF MERCURY IN LAKE WATER AND THE RELATIONSHIP OF MERCURY IN WATER AND IN SEDIMENTS ARE DISCUSSED;

87 CHAWLA, VINOD K.;
CHANGES IN THE WATER CHEMISTRY OF LAKES ERIE AND ONTARIO;
(1971) BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES. V. 25, NO. 2. PP. 31-64.;
WATER; CHEMICAL COMPOSITION; NUTRIENTS; PHOSPHORUS; NITROGEN; DISSOLVED OXYGEN; HEAVY METALS;
BUF-BSNS-BULL-25(2); GCODE4; GCODE5;

88 CHEN, CHEN T.; MILLERO, FRANK J.;
EFFECT OF SALT CONTENT ON THE TEMPERATURE OF MAXIMUM DENSITY AND ON STATIC STABILITY IN LAKE ONTARIO;
(1977) LIMNOLOGY AND OCEANOGRAPHY 22(1):158-159;
SALINITY; TEMPERATURE; MATHEMATICAL MODELS;
GCODE5;

89 CHERMACK, EUGENE;
LAKE ONTARIO ATLAS: LAKE TEMPERATURES;
(1977) NY STATE SEA GRANT INSTITUTE. 41PP;
TEMPERATURE; WATER;
US-CN-NY-OA-77-008; GCODE5;
THE LAKE TEMPERATURES MONOGRAPH PROVIDES A COMPOSITE OF MEASUREMENTS TAKEN BY SURFACE CRAFT, AIRCRAFT AND INTAKES. ALSO INCLUDED ARE DETAILED ANALYSES OF SURFACE TEMPERATURES BY MONTHS, VS. AIR TEMPERATURES, BY CUMULATIVE FREQUENCIES, VS. DISTANCE OFFSHORE AND VS. DEPTH. A SLIGHT DOWNWARD TREND IN WATER TEMPERATURE SINCE THE 1930'S EXISTS. THIS MONOGRAPH WILL BE USEFUL FOR PHYSICAL, CHEMICAL AND BIOLOGICAL LIMNOLOGICAL STUDIES AS WELL AS THE PLANNING OF WATER AND/OR SANITARY SEWER SYSTEMS;

90 CHERMACK, EUGENE E.; GALLETTA, THOMAS A.;
POWER PLANT THERMAL EFFLUENTS IN SOUTHEASTERN LAKE ONTARIO;
(1973) PROC 16TH CONF GREAT LAKES RES, P663-674;
EFFLUENTS; THERMAL; COASTAL ZONE; ANALYSIS; ELECTRIC POWER GENERATING STATIONS;
IGR-C16-1973; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D5;
ANALYSES OF DATA TAKEN BY AN AIRBORNE INFRARED THERMOMETER OVER THE PAST 2 YEARS ARE PRESENTED. THE GEOGRAPHICAL REGION OF COVERAGE INCLUDES POWER PLANT SITES ALONG LAKE ONTARIO'S SOUTH SHORE FROM WEST OF ROCHESTER TO THE MEXICO BAY AREA IN NY. THIS AREA IS CURRENTLY BEING DEVELOPED TO BECOME A MAJOR POWER GENERATION CORRIDOR IN THE NEXT 10 YRS. DATA INCLUDE DETAILED SURFACE THERMAL STRUCTRUE IN THE IMMEDIATE VICINITY OF 4 POWER PLANT OUTFALLS AS WELL AS THERMAL STRUCTURE OF LARGE AREAS OF THE LAKE ADJACENT TO AND LAKEWARD OF THE OUTFALLS IN ORDER TO PROVIDE BASELINE DATA. ATTEMPTS TO OBTAIN DATA IN ALL SEASONS HAVE BEEN MADE AND THIS COLLECTION THUS CONTAINS DATA FROM EVERY MONTH OF THE YEAR. PARTICULARLY, ANALYSIS HAS CENTERED ON THE SIZE, SHAPE AND BEHAVIOR OF THE EFFLUENT POOLS UNDER VARYING WIND, LAKE CURRENT AND SEASONAL CONDITIONS PLUS THE AMBIENT OR BACKGROUND THERMAL FIELD. THE DATA WERE INTERPRETED IN THE LIGHT OF THE CURRENT NY STATE GUIDELINES FOR THERMAL EFFLUENTS. PRELIMINARY RESULTS INDICATE THE NEED FOR FURTHER ELABORATION OR REVISION OF THESE GUIDELINES, IF THEY ARE TO BE APPLIED TO LARGE LAKES;

91 CHESTERS, GORDON; SIMSIMAN, GERONIMO V.;
IMPACT OF AGRICULTURAL USE OF PESTICIDES ON THE GREAT LAKES;
(1974) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES, 93PP;
WATER QUALITY; LAND USE; PESTICIDES; AGRICULTURAL POLLUTION; CHEMICAL LOADING; HERBICIDES; RUNOFF DRAINAGE;
IJC-LW-VOL. 1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

92 CHRISTIE, W. JACK;

A COMMENT ON THE WORKSHOP ON ENVIRONMENTAL VALUE MAPPING;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON
ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P211-212;
MAPPING; RESEARCH;
IJC-RA7; GCODE6;

93 CHRISTIE, W. JACK;
ONTARIO FISHERIES MANAGEMENT IN RELATION TO THE CONCEPT OF BIOLOGICAL
ALLOCATION;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON
ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P103-107;
FISHERIES; MANAGEMENT; MAPPING;
IJC-RA7; GCODE6;

94 CHRISTIE, W. JACK;
A REVIEW OF THE CHANGES IN THE FISH SPECIES COMPOSITION OF LAKE ONTARIO;
(1973) GREAT LAKES FISHERY COMMISSION TECHNICAL REPORT NO 23, 65P;
COMMERCIAL FISHERIES; POPULATION DYNAMICS; FISH;
GLF-TR23; GCODE5;
THE STATISTICS OF THE COMMERCIAL FISH CATCH, ALONG WITH DATA FROM PAST SURVEYS OF THE FISH SPECIES COMPOSITION OF LAKE ONTARIO, ARE REVIEWED. THIS PROVIDES A CHRONICLE OF THE PROGRESSIVE DETERIORATION OF THE FISH FAUNA IN TERMS OF NUMBERS OF ECONOMICALLY VALUABLE SPECIES PRESENT. IN THE ORIGINAL CONDITION THE LAKE SUPPORTED STOCKS OF ATLANTIC SALMON, LAKE TROUT, LAKE WHITEFISH, AND A NUMBER OF LESSER COREGONID SPECIES. AT PRESENT ALL OF THESE ARE EXTINCT OR VIRTUALLY SO, AND THE OPEN WATERS OF THE LAKE ARE OCCUPIED MAINLY BY THE NON-INDIGENOUS RAINBOW SMELT AND ALEWIFE. MANY IMPORTANT CHANGES IN THE FISH STOCKS OCCURRED IN THE EARLY YEARS OF MAN'S INTERFERENCE WITH THE LAKE. SOME EFFECTS OF THE DEFORESTATION OF THE WATERSHED, AND DAMMING THE STREAMS ARE SUGGESTED, BUT IN GENERAL IT IS FELT THAT THE MAJOR EFFECTS OF CHANGES IN THE ABIOTIC ENVIRONMENT ON THE FISH STOCKS, HAVE ONLY MANIFESTED THEMSELVES RECENTLY. OVERFISHING APPEARS TO HAVE BEEN THE MAJOR DESTABILIZING INFLUENCE. IT IS SUGGESTED THAT THE DEPRESSION OF PISCIVORE STOCKS BY EXCESSIVE FISHING PERMITTED THE PROLIFERATION OF THE COLONIZING RAINBOW SMELT AND ALEWIFE. THIS DEPRESSION MAY ALSO HAVE INCREASED THE IMPACT OF THE SEA LAMPREY ON THE PREMIUM FISH STOCKS, AND THE PROLIFERATION OF OTHER NATIVE FISHES MAY HAVE ACTED ALONG WITH THE COLONISTS, TO PREVENT RETURN OF THE PREMIUM SPECIES UPON RELAXATION OF THE FISHING PRESSURE. THE ABYSS OF THE MAIN LAKE IS NOT INHABITED BY FISH EXCEPT IN WINTER AT PRESENT. IT IS SUGGESTED THAT THE LAKE TROUT AND BURBOT STOCKS WERE THE MAIN VECTORS OF MATERIALS AND ENERGY IN THE LAKE PREVIOUSLY. NO COMPARABLE CIRCULATORY SYSTEM CAN BE IDENTIFIED IN THE CURRENT CIRCUMSTANCES;

95 CLARK, L. J.;
LAKE CURRENTS;
(1890) TRANSACTIONS ROYAL CANADIAN INSTITUTE. VOL. 11. PP154-157;
LAKES; CURRENTS; WATER; POTABILITY; SEWERAGE; MUNICIPAL SEWAGE TREATMENT; WASTE TREATMENT;
2692; GCODE5C2;

96 CLEMENCY, CHARLES V.;
THE GYPSUM DEPOSITS OF THE SALINA GROUP OF WESTERN NEW YORK;
(1964) GEOLOGY OF WESTERN NEW YORK GUIDEBOOK, NY STATE GEOLOGICAL ASSOC 36TH
ANNUAL MEETING, PP75-81;
GEOLOGY; MINERALOGY; NY;
NYG-36; GCODE4G5; GCODE5A4;

97 CLEVENGER, RAYMOND F.; MACLAREN, J. W.;
NEW REQUIREMENTS IN WATER RESOURCES PLANNING ON THE GREAT LAKES;
(1966) PROC GREAT LAKES WATER RESOURCES, PP361-391;
DEVELOPMENT PLANNING, WATER; IJC; GLBC;
CAN-FIC-1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE PAPER REFERS TO PRESENT CONDITIONS ON THE GREAT LAKES, INCLUDING THE COMPLEXITY AND INTER-EFFECT OF THE VARIOUS USES OF THE RESOURCE. IT DISCUSSES AT LENGTH THE TYPE OF ACTION THAT WILL BE REQUIRED TO INTRODUCE APPROPRIATE

PLANNING TO PERMIT THE OPTIMUM DEVELOPMENT OF THE RESOURCES ON BOTH SIDES OF THE BORDER. RECOMMENDATIONS ARE THEN MADE FOR THE ORGANIZATIONAL PROCEDURES NECESSARY TO IMPLEMENT THE STUDY AND THE PLAN, INCLUDING REFERENCE TO THE ROLES OF THE RECENTLY ESTABLISHED GREAT LAKES BASIN COMMISSION AND THE CONTINUING ROLE OF THE IJC.;

98 COAKLEY, JOHN P.; DURHAM, RAY W.; NELSON, D. ERLE; GOBLE, ROBERT J.;
DETERMINATION OF NEARSHORE SEDIMENT MOVEMENT IN THE GREAT LAKES USING NEUTRON-ACTIVABLE GLASS SAND;
(1974) MEM INST GEOL BASSIN AQUITAINE, 7:363-368;
SEDIMENT; TRACERS; SAMPLE COLLECTION;
GCODES;
IN CONTRAST TO THE LARGE NUMBER OF SEDIMENT TRACING STUDIES USING EITHER RADIOACTIVE OR FLUORESCENT TRACERS, VERY LITTLE ATTENTION HAS BEEN GIVEN TO ACTIVABLE MATERIALS AS TRACERS. TESTS CARRIED OUT IN 1972 BY CCIW HAVE DEMONSTRATED THE UTILITY OF SUCH METHODS IN CASES WHERE ENVIRONMENTAL CONSIDERATIONS PRECLUDE THE USE OF RADIOACTIVE TRACERS, OR WHERE GREATER RESOLUTION THAN THAT PROVIDED BY FLUORESCENT TRACERS IS REQUIRED. TWO 35 KG TRACER "PLUGS" (ONE COMPOSED OF LOCAL SAND COATED WITH RHODAMINE-B FLUORESCENT DYE AND THE OTHER, A SPECIALLY PREPARED GLASS SAND CONTAINING 3.9% ANTIMONY, BY WEIGHT) WERE INJECTED SIDE BY SIDE IN THE BOTTOM OF LAKE ONTARIO, AT A WATER DEPTH OF 7.5 METERS. DIVERS PERIODICALLY COLLECTED SAMPLES ALONG A RADIAL GRID CENTERED ON THE GLASS INJECTION POINT AND THE CONCENTRATION OF TRACER MATERIALS IN EACH SAMPLE WAS DETERMINED BOTH BY VISUAL ESTIMATION UNDER ULTRAVIOLET LIGHT AND BY NEUTRON-ACTIVATION ANALYSIS. THE RHODAMINE-B TRACER GRAINS WERE HARDLY DETECTABLE AND THEIR VALUE WAS DISCOUNTED. THE SB GLASS, HOWEVER, WAS DETECTABLE BOTH VISUALLY, DUE TO ITS FLUORESCENCE, AND BY NAA IN CONCENTRATIONS AS LOW AS 1 PPM OR ROUGHLY 1 TRACER GRAIN IN 30,000 SAND GRAINS. BACKGROUND LEVELS FOR SB IN THE SEDIMENT WERE ESTABLISHED INITIALLY AT LESS THAN 0.1 PPM. THE PATTERN OF BOTTOM SEDIMENT MOVEMENT IN THE STUDY AREA AS INDICATED BY THE TRACER DISTRIBUTION SUGGESTS THAT SIGNIFICANT MOVEMENT OCCURS ONLY UNDER CONDITIONS OF STORM WAVE ACTIVITY, AND THAT NET TRANSPORT IS CONSISTENTLY PARALLEL TO THE DIRECTION OF WAVE PROPAGATION, I.E. ONSHORE;

99 COHN, BARRY P.;
ACCRETION AND EROSION OF A LAKE ONTARIO BEACH, SELKIRK SHORES, NEW YORK;
(1973) PROC 16TH CONF GREAT LAKES RES, P390-396;
EROSION; BEACH EROSION; MORPHOLOGY; TRANSPORT; COASTAL ZONE;
IGR-C16-1973; GCODES05;
CHANGES IN PARTIAL BEACH MORPHOLOGY WERE STUDIED FROM OCTOBER 1971 TO OCTOBER 1972 FOR A 2-KILOMETER STRETCH OF LAKE ONTARIO SHORELINE NEAR PULASKI, NY. ESTIMATES OF NET SAND TRANSPORT WERE CALCULATED FROM WEEKLY BEACH PROFILES MEASURED FROM THE BASE OF THE DUNE INTO WATER DEPTHS OF 1.25 M. PROFILE CHANGES WERE EXAMINED IN TERMS OF WIND CONDITIONS AND FLUCTUATIONS IN LAKE LEVEL. LOSS OF SEDIMENT OCCURRED DURING SPRING AND SUMMER MONTHS WHEN HIGH LAKE LEVELS COINCIDENT WITH WINDS FROM THE NORTHWEST INDUCED STRONG WAVE ATTACK ON THE UPPER BEACH. LOWERED WATER LEVELS AND OFFSHORE WINDS DURING THE LATE SUMMER AND EARLY FALL INITIATED DEPOSITION UPON THE BEACHFACE AND IN THE EXTREME NEARSHORE ZONE. ACCRETION WAS NOT SUFFICIENT TO COMPENSATE FOR SPRING AND SUMMER LOSSES. AS A CONSEQUENCE, THE SHORELINE RETREATED 4.5 M DURING THIS 12-MONTH PERIOD. THE OBSERVED EROSION ENTAILED THE REMOVAL OF 8.4 X 1000 CUBIC METERS OF SAND (SOMEWHAT MORE THAN 100,000 TONS). 65% OF THIS LOSS OCCURRED FROM THE SUBAERIAL PORTION OF THE BEACH, THE REMAINDER HAVING BEEN REMOVED FROM THE EXTREME NEARSHORE ZONE;

100 CRAIG, LEE S.;
THE SEA GRANT PROGRAM IN THE GREAT LAKES AREA;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP150-156;
US; US SEA GRANT PROGRAM; MI; NY; WI; RESEARCH; PROGRAMS;
US-FCS-P1972; GCODE6;
SEA GRANT OBJECTIVES, AS STATED IN THE 1966 PUBLIC LAW WHICH CREATED IT, RELATE SPECIFICALLY TO MARINE EDUCATION AND TRAINING, APPLIED RESEARCH AND PREDEVELOPMENT, AND EXTENSTION AND ADVISORY SERVICES.;

101 CROWE, WALTER R.;
GREAT LAKES FISHERY COMMISSION HISTORY, PROGRAM, AND PROGRESS;
(1975) GREAT LAKES FISHERY COMMISSION. PP. 22.;
GREAT LAKES FISHERY COMMISSION; HISTORY; PROGRAMS; PETROMYZON MARINUS;
LAMPRICIDES;
GLF-1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

102 CSANADY, GABRIEL T.;
DISPERSAL OF EFFLUENTS IN THE GREAT LAKES;
(1970) WATER RESEARCH. VOL. 4 PP. 79-114;
DISPERSAL; EFFLUENTS; MATHEMATICAL MODELS; POLLUTION; WATER; LAKES; PLUMES;
CURRENTS;
2221; GCODE3; GCODE4; GCODE6;
A COMPREHENSIVE DESCRIPTION IS GIVEN OF THE PHYSICAL FACTORS INVOLVED IN THE
DISPERSAL OF "CONSERVATIVE" POLLUTANTS IN THE GREAT LAKES, BASED MAINLY ON
EXPERIMENTAL DATA OBTAINED IN LAKES HURON AND ERIE OVER 7 YEARS. PARAMETERS
IMPORTANT IN SMALL-SCALE DIFFUSION PROBLEMS ARE CURRENT SPEED U AND EFFECTIVE
(EDDY) DIFFUSIVITY IN THE HORIZONTAL, K (SUBY), AND IN THE VERTICAL, K (SUBZ).
CONSTANT VALUES OF THESE PARAMETERS ADEQUATELY DESCRIBE THE DIFFUSION OF
INDIVIDUAL PARCELS OR PLUMES OF MARKED FLUID, BUT THE APPROPRIATE VALUES OF K
(SUBY) AND K (SUBZ) DEPEND (AS MAY BE EXPECTED) ON TURBULENCE INTENSITY, WHICH
IS IN TURN DEPENDENT ON THERMAL STRATIFICATION, PARTICULARLY IN THE CASE OF
VERTICAL DIFFUSION. HORIZONTAL DIFFUSION MAY BE ACCELERATED BY CURRENT SHEAR. ON
A LARGER SCALE, THE MEANDERING OF EFFLUENT PLUMES BECOMES AN IMPORTANT DISPERSAL
MECHANISM. WITH SOME MEANDERING, HOWEVER, EFFLUENTS DISCHARGED NEAR SHORE ALMOST
ALWAYS GENERALLY FOLLOW THE SHORELINES, APPARENTLY IN RESPONSE TO THE LAKE-WIDE
FLOW PATTERN WHICH IS BELIEVED TO BE CHARACTERIZED BY "COASTAL JETS" NEAR SHORES
AND (AT LEAST DURING THE SUMMER PERIODS) OSCILLATING CURRENTS IN THE CENTRAL
PORTIONS. THE RESULTING PHENOMENON OF "COASTAL ENTRAPMENT" OF POLLUTANTS LEADS,
FOR A NEAR-SHORE SOURCE, TO THE FORMATION OF A RELATIVELY HEAVILY POLLUTED
INFLUENCE REGION OF TYPICALLY PERHAPS 25 KM EXTENT EITHER SIDE OF THE SOURCE.
QUANTITATIVE MODELLING OF SMALL AND LARGE SCALE EFFLUENT PLUMES IS THEN
ILLUSTRATED. THE RESULTS SHOW THAT, FOR THE PRACTICALLY MOST IMPORTANT CASES,
DILUTION OF EFFLUENTS DISCHARGED NEAR THE SHORES BY THE CURRENTS AND EDDIES OF
THE GREAT LAKES IS SO FEEBLE AS TO BE ALMOST NEGLIGIBLE. CONSEQUENTLY, TO
ACHIEVE PRACTICALLY SIGNIFICANT DILUTION, ONE HAS TO RELY MAINLY ON THE
EFFICIENT DESIGN OF DIFFUSER PORTS. ALTERNATIVELY, THE POSSIBILITY (SO FAR
UNPROVEN) MAY EXIST OF ACHIEVING DILUTION THROUGH AN OUTFALL LOCATED AT A
CONSIDERABLE DISTANCE (5 MILES OR MORE) FROM THE SHORES;

103 CSANADY, GABRIEL T.;
DISPERSAL OF FOREIGN MATTER BY THE CURRENTS AND EDDIES OF THE GREAT LAKES;
(1966) U OF MI GREAT LAKES RES DIVISION PROC 9TH CONF GREAT LAKES RES, P283-294;
DIFFUSION; CURRENTS; EDDY DIFFUSIVITY; TURBULENCE; MATHEMATICAL MODELS;
IGR-09-1966; GCODE6;
THE CONCENTRATION OF SOME EFFLUENT AT A GIVEN POINT IN A LAKE AT A GIVEN TIME
AFTER RELEASE IS A RANDOM VARIABLE, THE FULL SPECIFICATION OF WHICH CAN ONLY BE
EFFECTED IN TERMS OF PROBABILITY DISTRIBUTIONS. IN PRACTICE ONE WOULD BE
INTERESTED IN THE MAXIMUM CONCENTRATION WHICH OCCURS WITH A GIVEN PROBABILITY.
EXPERIMENTAL DATA AVAILABLE SO FAR DO NOT ALLOW OF SUCH ESTIMATES AS THEY ONLY
REFER TO MEAN CONCENTRATIONS. PREVIOUS WORK CARRIED OUT BY THE WATERLOO RESEARCH
GROUP HAS SHOWN THAT, AS FAR AS MAY BE JUDGED FROM THE FIELD OF MEAN
CONCENTRATION, HORIZONTAL DIFFUSION IS MAINLY A PRODUCT OF THE (COMPLEX)
CURRENTS, WHILE VERTICAL DIFFUSION DEPENDS ON THE SUPPLY OF EDDIES. SOME NEW
WORK CARRIED OUT LAST SUMMER CONCERNED THE STUDY OF RICHARDSON'S
DISTANCE-NEIGHBOUR FUNCTION, WHICH IS RELATED TO THE MEAN-SQUARE CONCENTRATION
FLUCTUATIONS, AS WELL AS TO THE MEAN. FURTHER WORK IN THIS DIRECTION IS HOPED TO
LEAD TO A MORE DETAILED DESCRIPTION OF THE TURBULENT DIFFUSION PROCESS IN THE
GREAT LAKES. SOME CALCULATIONS ARE PRESENTED TO SHOW POTENTIAL POLLUTION HAZARDS
FROM VARIOUS INDUSTRIAL PLANTS;

104 CSANADY, GABRIEL T.;
INTERMITTENT 'FULL' UPWELLING IN LAKE ONTARIO;
(1977) JOURNAL OF GEOPHYSICAL RESEARCH. VOL. 82, NO. 3. PP. 397-419.;

UPWELLING ; WIND; MATHEMATICAL MODELS; MESOLIMNION; CURRENTS; TEMPERATURE;
GCODES; 5345;
A STRONG ENOUGH LONGSHORE IMPULSE LEAVING THE COAST TO THE LEFT (DOWNWIND) GENERATES 'FULL' UPWELLING IN WHICH THE THERMOCLINE COMES TO INTERSECT THE FREE SURFACE. THIS PROBLEM MAY BE TREATED AS A SIMPLE GEOSTROPHIC ADJUSTMENT PROBLEM IN WHICH THE WIND STRESS IS SUPPOSED TO BE EXERTED ON A TWO-LAYER FLUID. A MINIMUM IMPULSE IS FOUND TO BE NECESSARY FOR A FULL UPWELLING TO DEVELOP FROM HYDROSTATIC EQUILIBRIUM. WHEN THE UPWELLING-FAVORING WIND IMPULSE IS GREATER THAN THE MINIMUM, THE UPWELLED FRONT MOVES OFFSHORE BY A DISTANCE PROPORTIONAL DIRECTLY TO THE EXTRA IMPULSE AND INVERSELY TO TOP LAYER DEPTH TIMES CORIOLIS PARAMETER. UPWELLING EPISODES OBSERVED IN LAKE ONTARIO DURING THE IFYGL AND FEASIBILITY STUDIES BEFORE IFYGL SHOW A FRONTAL BEHAVIOR IN GOOD QUANTITATIVE AGREEMENT WITH THE SIMPLE THEORETICAL MODEL. IN A CLOSED BASIN, FULL UPWELLING FOLLOWING A WIND STRESS IMPULSE OCCURS OVER ONLY A PORTION OF THE SHORELINE. GIVEN QUIESCENT CONDITIONS, THE UPWELLED FRONT MAY BE EXPECTED TO PROPAGATE ALONGSHORE, SOMEWHAT AS AN INTERNAL KELVIN WAVE. OBSERVATIONS IN OCT 1972 IN LAKE ONTARIO SHOW FRONTAL MOTIONS RESEMBLING INTERNAL KELVIN WAVES. HOWEVER, ONLY ONE HALF OF THE WAVES PROPAGATES, THAT HALF IN WHICH PARTICLE VELOCITIES HAVE THE SAME DIRECTION AS THE WAVE PROPAGATION VELOCITY. THE PROPAGATION WARM ZONE IS MUCH NARROWER THAN THE COLD UPWELLED ZONE WHICH DEVELOPED UNDER A SUCCESSION OF PREVIOUS WIND IMPULSES.;

105 CSANADY, GABRIEL T.;
LARGE-SCALE MOTION IN THE GREAT LAKES;
(1967) J. OF GEOPHYSICAL RESEARCH. VOL. 72. NO. 16. PP4151-4162;
CORIOLIS FORCE; WAVES; SEICHES; MESOLIMNION; CURRENTS; MATHEMATICAL MODELS;
1455; GCODES;
LARGE-SCALE MOTION IN THE GREAT LAKES CAN BE ASSUMED TO BE OF SMALL ROSSBY NUMBER, SO THAT THE EQUATIONS OF MOTION CAN BE LINEARIZED AND AT THE SAME TIME THE VARIATION OF THE CORIOLIS PARAMETER WITH LATITUDE CAN BE NEGLECTED. WHEN APPLIED TO A TWO-LAYER LAKE MODEL, THE EQUATIONS BECOME IDENTICAL WITH THE EQUATIONS GOVERNING THE BEHAVIOR OF SURFACE AND INTERNAL SEICHES IN LAKES, BUT NOW 'CURRENT-LIKE', AS WELL AS 'WAVE-LIKE' SOLUTIONS TO THESE EQUATIONS BECOME OF INTEREST. THE FOUR EQUATIONS OF MOTION IN THE HORIZONTAL (ASSUMING HYDROSTATIC PRESSURE DISTRIBUTION IN THE VERTICAL) AND THE TWO CONTINUITY EQUATIONS CAN BE REDUCED TO TWO INDEPENDENT SETS OF EQUATIONS FOR THE PRINCIPAL 'INTERVAL' AND 'SURFACE' MODES. THE SOLUTIONS OF EACH OF THESE COMPRISE ONE STATIONARY MODE, POSSIBLY SOME VERY SLOW PERIODIC MODES AKIN TO KELVIN WAVES (BUT ONLY IF THE BASIN IS LARGE ENOUGH) AND SOME FASTER PERIODIC MODES CORRESPONDING TO SURFACE AND INTERNAL SEICHES WHICH ROTATE AROUND THE BASIN. WHEN APPLIED TO A CIRCULAR BASIN, CONSTANT DEPTH 'MODEL GREAT LAKE' (OF DIMENSIONS AND OTHER CHARACTERISTICS APPROPRIATE TO THE GREAT LAKES) THE THEORY SUGGESTS THE EXISTENCE OF (1) BAROCLINIC 'COASTAL JETS' DURING THE SUMMER STRATIFICATION; (2) SLOW COUNTERCLOCKWISE ROTATING INTERNAL WAVES OF A PERIOD MANY TIMES THE HALF-PENDULUM DAY; AND (3) SURFACE AND INTERNAL SEICHES ROTATING IN EITHER DIRECTION AND HAVING A PERIOD OF AT MOST SEVERAL HOURS (SURFACE MODES) OR UP TO WITHIN A SMALL FRACTION OF THE INERTIAL PERIOD (INTERNAL MODES). AN EXAMINATION OF THE AVAILABLE OBSERVATIONAL MATERIAL INDEED SUGGESTS THAT THESE FEATURES ARE DETECTABLE IN THE GREAT LAKES;

106 CSANADY, GABRIEL T.;
MOTIONS IN A MODEL GREAT LAKE DUE TO A SUDDENLY IMPOSED WIND;
(1968) J. OF GEOPHYSICAL RESEARCH. VOL. 73. NO. 20. PP6435-6447;
WIND; CURRENTS; SEICHES; WAVES; MESOLIMNION; CORIOLIS FORCE; MATHEMATICAL MODELS;
1454; GCODES;
A SOLUTION IS PRESENTED FOR THE INITIAL VALUE PROBLEM THAT ARISES WHEN A UNIFORM WIND STRESS IS SUDDENLY IMPOSED ON THE SURFACE OF A CIRCULAR, CONSTANT DEPTH, TWO-LAYER LAKE THAT HAS SIMILAR CHARACTERISTICS TO THE GREAT LAKES UNDER SUMMER CONDITIONS. EVEN WITH THIS MINIMUM NUMBER OF DYNAMICALLY SIGNIFICANT FEATURES IN THE THEORETICAL MODEL (CLOSED BASIN, TWO-LAYER STRUCTURE, AND CONSTANT CORIOLIS PARAMETER) A NUMBER OF EXPERIMENTALLY FOUND FEATURES IN THE BEHAVIOR OF THE GREAT LAKES ARE REPRODUCED IN A REALISTIC WAY, THE MOST IMPORTANT SUCH PHENOMENA BEING (1) LARGE THERMOCLINE MOVEMENTS NEAR THE SHORES, (2) COASTAL JETS, (3)

ROTARY CURRENTS IN THE CENTER PORTION, (4) STANDING INTERNAL WAVES OF LONG WAVELENGTH AND LARGE AMPLITUDE, (5) STANDING SURFACE SEICHES, AND (6) ROTATING SURFACE AND INTERNAL SEICHES;

107 CSANADY, GABRIEL T.;
SIMPLE ANALYTICAL MODELS OF WIND-DRIVEN CIRCULATION IN THE GREAT LAKES;
(1968) PROC 11TH CONF GREAT LAKES RES, P371-384;
CURRENTS; MATHEMATICAL MODELS; WIND; CORIOLIS FORCE; COASTAL ZONE; MESOLIMNION;
IGR-C11-1968; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
RECENT ANALYTICAL AND NUMERICAL STUDIES OF "MODEL GREAT LAKES" ARE SURVEYED AND THEIR IMPLICATIONS FOR EXPERIMENTAL WORK ARE DISCUSSED. THE IMPORTANT DYNAMICAL FACTORS IN DETERMINING LARGE-SCALE WATER MOVEMENTS IN THE GREAT LAKES APPEAR TO BE; (1) WIND STRESS; (2) THE CONSTRAINT OF CONTINUITY IMPOSED BY THE SHORES IN A CLOSED BSSIN; (3) CORIOLIS FORCE, WHICH MAY BE ASSUMED CONSTANT FOR A BASIN OF GREAT LAKES DIMENSIONS. THE THEORETICAL STUDIES REVEAL THAT, IN ADDITION TO THESE 3 ESSENTIAL FACTORS, THE SUMMER DENSITY STRATIFICATION AND THE VARIATIONS IN DEPTH ALSO EXERT A CONTROLLING INFLUENCE ON THE CURRENT PATTERNS. THE INFLUENCE OF BOTTOM AND SHORE FRICTION APPEARS TO BE MINOR, BUT THIS IS NOT CONCLUSIVELY ESTABLISHED. CONSPICUOUS AND LARGE-SCALE FEATURES OF THE CIRCULATION PREDICTED BY THEORY ARE (1) COASTAL JETS; (2) THERMOCLINE MOVEMENTS IN THE SHORE ZONES AND (3) ROTATION OF CURRENT PATTERNS. SOME SCANT EXPERIMENTAL EVIDENCE EXISTS ON THESE INTERESTING AND IMPORTANT PHENOMENA, BUT A GOOD DEAL MORE WORK IS REQUIRED, MOST OF WHICH MAY BE CARRIED OUT NEAR THE SHORES, AND THE RESULTS SHOULD BE PARTICULARLY RELEVANT TO HUMAN ACTIVITIES ON THE SHORES OF THE GREAT LAKES;

108 CSANADY, GABRIEL T.;
WIND-DRIVEN SUMMER CIRCULATION IN THE GREAT LAKES;
(1968) J. OF GEOPHYSICAL RESEARCH. VOL. 73. NO. 8. PP2579-2589;
MESOLIMNION; WIND; CURRENTS, MATHEMATICAL MODELS;
1456; GCODE2; GCODE3; GCODE5, GCODE6; SIMPLIFIED MODELS OF WIND-FORCED MOTIONS ARE CONSIDERED IN THE TWO-LAYER CIRCULAR BASIN 'MODEL GREAT LAKE' INTRODUCED IN AN EARLIER PAPER. UNDER SUMMER CONDITIONS, WHEN A THERMOCLINE IS PRESENT, BOTH A UNIFORM, STEADY WIND AND A UNIFORM WIND VARYING PERIODICALLY IN TIME PRODUCE A FRICTIONLESS LAKE RESPONSE CHARACTERIZED BY STRONG BOUNDARY CURRENTS AND PRONOUNCED THERMOCLINE MOVEMENTS IN THE SHORE ZONE. THE LENGTH SCALE DETERMINING THE WIDTH OF THIS SHORE ZONE IS THE 'RADIUS OF DEFORMATION,' TYPICALLY THREE MILES. OBSERVATIONS ON LAKES HURON, MICHIGAN, AND ONTARIO SHOW SUCH MOTIONS TO BE PRESENT NEAR THE SHORES;

109 CSANADY, GABRIEL T.;
WIND EFFECTS ON SURFACE BOTTOM FRONTS;
(1978) J GEOPHYSICAL RES 83(C9):4633-4640;
WIND; COASTAL ZONE; MATHEMATICAL MODELS; MESOLIMNION;
7932; GCODE5;
IN NEARSHORE REGIONS, WATER OF REDUCED DENSITY IS FREQUENTLY PRESENT OWING TO FRESHWATER INFLUX OR SPRING HEATING. UNDER SOME CIRCUMSTANCES, LIGHT NEARSHORE WATER IS CONFINED TO ONE SIDE OF A DENSITY FRONT, EXTENDING FROM SURFACE TO BOTTOM, AND IS CALLED 'SPRING THERMOCLINE' OR 'SHELF EDGE FRONT.' THE SHAPE AND PERMANENCY OF THIS FRONT ARE AFFECTED BY WIND STRESS, WHICH MAY INTERFERE WITH THE MOMENTUM BALANCE IN A DIRECTION PARALLEL TO THE FRONT AND CAUSE GEOSTROPHIC ADJUSTMENT MOTIONS NORMAL TO THE FRONT. A SIMPLE GEOSTROPHIC ADJUSTMENT THEORY ELUCIDATES SOME OF THE MORE IMPORTANT EFFECTS OF WIND ON SUCH FRONTS. WINDS OPPOSING THE GEOSTROPHIC FLOW ABOVE THE INCLINED FRONT TEND TO FLATTEN ITS SHAPE AND EVENTUALLY DESTROY THE FRONT, SOMETIMES CAUSING THE FORMATION OF A SURFACE LENS OP BUBBLE. COMPARISON WITH OBSERVATIONS FROM LAKE ONTARIO AND FROM THE NEW ENGLAND CONTINENTAL SHELVES SHOWS THAT THE THEORY GIVES A REALISTIC FIRST-ORDER DESCRIPTION OF FRONTAL BEHAVIOR.;

110 CUTLER, N. L.;
THE BIOLOGICAL INVESTIGATIONS OF POLLUTION IN THE ERIE-NIAGARA WATERSHED;
(1929) NY STATE CONSERVATION DEPARTMENT. A BIOLOGICAL SURVEY OF THE ERIE-NIAGARA SYSTEM. PP. 134-139;
POLLUTION; TUBIFEX;

GCODE4; GCODE46; GCODE4E3; GCODE5A413; GCODE465; NY-C1;

111 CZAIKA, SHARON C.;
CRUSTACEAN ZOOPLANKTON OF SOUTHWESTERN LAKE ONTARIO IN 1972 DURING THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES;
(1974) PROC 17TH CONF GREAT LAKES RES, P1-16;
ZOOPLANKTON; CRUSTACEA; COPEPODA; CALANOIDA; CLADOCERA; ABUNDANCE; DISTRIBUTION; HARPACTICOIDA;
IGR-C17-1974; GCODE5A4; GCODE5B2; GCODE564; GCODE5C2;
THE SAMPLING MATRIX HAD 7 TRANSECTS PERPENDICULAR TO SHORE RUNNING FROM PORT WELLER TO ROCHESTER WITH 3 STATIONS IN EACH TRANSECT AT 1/2, 4, AND 8 KM FROM SHORE. SAMPLING WAS CONDUCTED DURING 16 CRUISES FROM MID-APRIL TO MID-DECEMBER, 1972. COPEPOD NAUPLII WERE THE MOST ABUNDANT IDENTIFICATION GROUP FOLLOWED BY BOSMINIDS WITH MOCRO AND IMMATURE CYCLOPOID COPEPODIDS. THE OTHER COMMON IDENTIFICATION GROUPS IN DECREASING ORDER OF ABUNDANCE WERE DAPHNIA RETROCURVA, CERIODAPHNIA LACUSTRIS, CYCLOPS BICUSPIDATUS THOMASI, TROPOCYCLOPS PRASINUS MEXICANUS, IMMATURE CALANOID COPEPODIDS, AND EUBOSMINA COREGONI. WITH THE EXCEPTION OF E. COREGONI, THESE GROUPS PEAKED IN SEPTEMBER AND OCTOBER. THE COMMON CLADOCERANS EXHIBITED THE TYPICAL CLADOCERAN PATTERN OF WINTER AND SPRING ABSENCE FOLLOWED BY VERY HIGH MAXIMA IN LATE SUMMER AND EARLY FALL, ESPECIALLY CLOSEST TO SHORE. SEVERAL SPECIES WERE ENCOUNTERED WHICH HAVE NOT BEEN REPORTED PREVIOUSLY FROM LAKE ONTARIO. AMONG THESE ARE PERHAPS 3 SPECIES OF ALONA, CAMPTOCERCUS RECTIROSTRIS, EURYCERCUS LAMELLATUS, A SPECIES OF EUCYCLOPS, AND 5 SPECIES OF HARPACTICOID COPEPODS (BRYOCAMPTUS NIVALIS, CANTHOCAMPTUS ROBERTCOKERI, CANTHOCAMPTUS STAPHYLINOIDES, MESOCHRA ALASKANA, MORARIA CRISTATA);

112 DAVID, ELIZABETH L.;
PUBLIC PERCEPTIONS OF WATER QUALITY;
(1971) WATER RESOURCES RES, 7(3), PP453-457;
WATER QUALITY; PUBLIC PARTICIPATION; WI;
2743; GCODE4; GCODE5; GCODE2; GCODE2B1T3;
WATER POLLUTION IS PERCEIVED BY THE GENERAL PUBLIC TO BE OF INCREASING CONCERN AS A MAJOR PROBLEM FACING THE STATE. FROM A SURVEY OF A REPRESENTATIVE SAMPLE OF ADULTS IN WISCONSIN, IT WAS SHOWN THAT THE PUBLIC HAS RATHER DEFINITE IDEAS ABOUT WHAT CONSTITUTES A DESCRIPTION OF POLLUTION. THE RESPONDENTS MENTIONED ALGAE AND MURKY, DARK WATER BUT DID NOT OFTEN MENTION ATTRIBUTES SUCH AS CHEMICALS OR DISEASE GERMS THAT ARE NOT DETECTED BY THE HUMAN SENSORY SYSTEM. WHEN THE RESPONDENTS WERE ASKED TO NAME WATER IN THE STATE THAT THEY FELT WAS POLLUTED, THEY NAMED WATERS THAT IN FACT HAVE THE CHARACTERISTICS THEY DESCRIBED WHEN DEFINING POLLUTION. THE MOST WIDELY USED INDICATORS OF WATER POLLUTION SEEM INSUFFICIENT IN LIGHT OF THE PUBLIC DEFINITION OF, AND CONCERN ABOUT, WATER POLLUTION;

113 DAVIES, TUDOR T.; THOMAS, NELSON A.;
GREAT LAKES PROGRAMS OF THE GROSSE ILE LABORATORY;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP82-86;
US; RESEARCH; PROGRAMS; REGULATORY AGENCY;
US-FCS-F1972; GCODE6;

114 DECHTIAR, ALEX;
NEOECHINORHYNCHUS NOTEMIGONI N. SP. (ACANTHOCEPHALA: NEOECHINORHYNCHIDAE) FROM GOLDEN SHINER OF LAKE ONTARIO;
(1967) CANADIAN J. ZOOLOGY, VOL. 45, NO. 2, PP155-159;
ACANTHOCEPHALA; NOTEMIGONUS CRYSOLEUCAS; FISH; PARASITES;
2594; GCODE5;
A NEW SPECIES OF ACANTHOCEPHALAN, NEOECHINORHYNCHUS NOTEMIGONI, FROM THE INTESTINE OF NOTEMIGONUS CRYSOLEUCAS (MITCHILL) IS DESCRIBED. THIS IS THE 23RD SPECIES OF THE FAMILY NEOECHINORHYNCHIDAE VAN CLEAVE, 1919 AND THE 15TH SPECIES OF THE GENUS NEOECHINORHYNCHUS HAMANN, 1892, KNOWN FROM NORTH AMERICAN FISH ACCORDING TO VARIOUS AUTHORS. IT IS THE SIXTH SPECIES OF THE GENUS NEOECHINORHYNCHUS WHICH DOES NOT UTILIZE CATOSTOMIDS AS DEFINITIVE HOSTS IN NORTH AMERICA;

115 DECOOKE, BENJAMIN G.;
GREAT LAKES REGULATION;
(1968) PROC 11TH CONF GREAT LAKES RES, PP627-639;
REGULATION; LAKE LEVELS; VOLUME AND CURRENT FLOW;
IGP-C11-1968; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE PAPER PRESENTS A BRIEF DESCRIPTION OF THE PHYSICAL CHARACTERISTICS AND OF THE HYDRAULICS AND HYDROLOGY OF THE GREAT LAKES SYSTEM, ALONG WITH A SUMMARY OF REGULATION STUDIES CONDUCTED DURING THE PAST HALF CENTURY. THE TECHNIQUE EMPLOYED TO DEVELOP CURRENT OPERATIONAL REGULATION PLANS ON THE LAKES AND THE LATEST INTERNATIONAL STUDIES FOR REGULATION OF THE ENTIRE GREAT LAKES, AND PROBLEMS OF SPECIAL INTEREST ENCOUNTERED THEREIN ARE DESCRIBED. DISCUSSION OF THE DERIVATION OF BASIC DATA (E.G. LEVELS, FLOWS, SUPPLIES, ETC.), UNIFORM BASE OF COMPARISON EMPLOYED IN THESE STUDIES, REQUIREMENTS OF REGULATION, VARIOUS APPROACHES TO REGULATION, AND METHODS OF EVALUATING RESULTS ARE INCLUDED;

116 DECOOKE, BENJAMIN G.; MEGERIAN, EDMOND;
FORECASTING THE LEVELS OF THE GREAT LAKES;
(1967) CORPS OF ENGINEERS. MISCELLANEOUS PAPER 67-2. REPRINTED FROM WATER RESOURCES RESEARCH, VOL. 3, NO. 2, PP. 397-403;
WATER LEVELS; PRECIPITATION; FORECASTING; WATER SUPPLY;
US-CE-L-MP67-2; GCODE6;
A DESCRIPTION IS GIVEN OF THE U.S. LAKE SURVEY METHOD OF FORECASTING GREAT LAKES WATER LEVELS. THE METHOD, IN GENERAL, CONSISTS OF DETERMINING A LEVEL FOR EACH MONTH OF A 6-MONTH FORECAST PERIOD ON EACH OF THE GREAT LAKES BY ROUTING A PREDICTED VOLUME OF WATER (NET BASIN SUPPLY) TO EACH OF THE GREAT LAKES BASINS. THE TECHNIQUE EMPLOYED IN PREDICTION OF THE VOLUME OF THE WATER CONSISTS OF USING MULTIPLE LINEAR REGRESSIONS BASED UPON U.S. WEATHER BUREAU PRECIPITATION AND TEMPERATURE DATA AS PREDICTORS FOR THE FIRST MONTH AND TREND PREDICTORS FOR THE SECOND THROUGH THE SIXTH MONTH. THIS TECHNIQUE RESULTS IN FORECASTING OF LAKE LEVELS ON THE AVERAGE FROM 15 TO 40% CLOSER TO THE RECORDED LAKE LEVELS, IN COMPARISON WITH THE TECHNIQUE THAT UTILIZES THE LONG-TERM AVERAGE VOLUME OF WATER AS THE BASIS OF PROJECTION;

117 DEL PRETE, KATHLEEN;
PHOSPHATE AND NITRATE STUDY IN LITTLE SODUS BAY, NEW YORK DURING WINTER ICE COVER AND EARLY SPRING, 1972;
(1974) RICE CREEK BIOLOGICAL FIELD STATION BULLETIN, 1(1):45-51;
NUTRIENTS; NITRATE; PHOSPHATE; PHOSPHORUS; NITROGEN; WATER; ICE;
NY-OCS-B1974-1; GCODE5O3;

118 DELFINO, JOSEPH J.;
GREAT LAKES: CHEMICAL MONITORING;
(1976) ENVIRONMENTAL SCIENCE & TECHNOLOGY, VOL.10, NO. 10, PP.986-990;
MONITORING; CHEMICAL COMPOSITION; POLLUTION;
3172; GCODE6; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5;

119 DENNIS, ROBERT E.;
US IFYGL SHIP SYSTEM: DESCRIPTION OF ARCHIVED DATA;
(1976) US. DEPT. OF COMMERCE. NOAA TECHNICAL REPORT EDS 27. 65PP;
NAVIGATION; RESEARCH ; ADVANCE II; IFYGL; DATA PROCESSING; DATA BASES; TEMPERATURE; RADIATION; WIND; DEPTH; DISSOLVED OXYGEN; CHLOROPHYLL; BAROMETRIC PRESSURE;
US-CN-TP-EDS-27; GCODE5;
THIS REPORT DESCRIBES THE DATA COLLECTED ABOARD THE U.S. SHIPS RESEARCHER AND ADVANCE II DURING THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES (IFYGL), A JOINT UNITED STATES-CANADIAN PROGRAM CONDUCTED IN 1972-73 FOR THE STUDY OF LAKE ONTARIO AND ITS BASIN.SENSORS,DATA ACQUISITION SYSTEMS, AND DATA PROCESSING PROCEDURES ARE DISCUSSED, AND INVENTORIES ARE GIVEN OF THE ARCHIVED DATA;

120 DEUTSCH, MORRIS;
EARTH RESOURCES OBSERVATION SYSTEMS PROGRAM RESEARCH AND PLANS FOR THE GREAT LAKES BASIN;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP46-66;
REMOTE SENSING; RESEARCH; PROGRAMS; THERMAL;

US-FCS-P1972; GCODE5; GCODE6;

121 DINGELL, JOHN D.;
GREAT LAKES POLLUTION;
(1966) MI NATURAL RESOURCES COUNCIL, 11TH ANNUAL CONFERENCE. PP19-26;
POLLUTION; ECONOMICS;
MI-NRC-C11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

122 DOLBEER, RICHARD A.; STEHN, ROBERT A.;
POPULATION TRENDS OF BLACKBIRDS AND STARLINGS IN NORTH AMERICA, 1966-76;
(1979) US DEPT OF INTERIOR FISH AND WILDLIFE SERVICE SPECIAL SCIENTIFIC REPORT WILDLIFE NO 214, PP99;
POPULATION DYNAMICS; STURNUS VULGARIS; AGELAIUS PHOENICEUS; MOLOTHRUS ATER; QUISCALUS QUISCULA; US; CANADA;
US-IF-SW214;
THEY USED THE NORTH AMERICAN BREEDING BIRD SURVEY TO ESTIMATE POPULATION TRENDS OF RED-WINGED BLACKBIRDS, COMMON GRACKLES, BROWN-HEADED COWBIRDS, AND STARLINGS FOR 1966-76 IN THE US AND CANADA. EXTENDED TO A CONTINENTAL SCALE, THE SURVEY INDICATED SIGNIFICANT INCREASES IN THE MEAN NUMBER OF RED-WINGS, COWBIRDS AND STARLINGS OBSERVED PER ROUTE. STARLINGS HAD THE GREATEST INCREASE, 4.96 BIRDS PER ROUTE OR A 19.4% INCREASE. THE STARLING'S GREATEST REGIONAL INCREASES OCCURRED IN THE WESTERN US. POPULATIONS OF RED-WINGS INCREASED MOST IN THE ST. LAWRENCE VALLEY AND PARTS OF THE MIDWEST AND LOWER PLAINS REGIONS. COWBIRDS INCREASED THE MOST IN THE PLAINS FROM IOWA TO SASKATCHEWAN AND DECREASED OVER PARTS OF THE EASTERN AND MIDWESTERN US. GRACKLE POPULATIONS INDICATED NO CHANGE ON A CONTINENTAL SCALE BUT DID SHOW STRONG INCREASES IN THE MIDWEST AND LOWER PLAINS REGIONS AND DECLINES IN APPALACHIA. THIS KNOWLEDGE OF BLACKBIRD AND STARLING POPULATION TRENDS IN SPECIFIC AREAS SHOULD IMPROVE OUR ABILITY TO UNDERSTAND INCREASING BIRD-MAN CONFLICTS, TO EVALUATE PROPOSED BIRD-DAMAGE CONTROL STRATEGIES, AND TO DEVELOP MORE EFFECTIVE, LONG-TERM SOLUTIONS THAN ARE AVAILABLE AT PRESENT.;

123 DONATO, ROBERT J.; HOBSON, GEORGE D.;
TRANSIT SONAR MEASUREMENTS IN LAKE ONTARIO OFF THE MOUTH OF THE NIAGARA RIVER;
(1968) PROC 11TH CONF GREAT LAKES RES, PP179-187;
SEISMIC PROFILING; SEISMICS; SEDIMENT; PHYSIOGRAPHY; BOTTOM;
(GR-C11-1968; 1C72; GCODE5A4;
RECORDS OBTAINED FROM A KELVIN HUGHES TRANSIT SONAR INSTRUMENT HAVE BEEN SPLICED TOGETHER AND A COMPARISON MADE BETWEEN AMPLITUDE OF SIGNAL AND BOTTOM SAMPLES TO IDENTIFY BOTTOM MATERIALS. SUPPLEMENTARY DATA FROM HYDROGRAPHIC CHARTS ENABLES A FAIRLY COMPREHENSIVE INTERPRETATION TO BE MADE. THERE IS VIRTUALLY NO PENETRATION INTO THE BOTTOM SEDIMENTS BY THE SOUND BEAM FROM THE SONAR, PENETRATION BEING ABOUT 1 IN INTO THE VERY RECENTLY DEPOSITED SEDIMENTS. THE RECORDED INTENSITY OF THE REFLECTED BEAM IS DEPENDENT BOTH UPON BOTTOM TOPOGRAPHY AND THE SEDIMENT MATERIALS AT THE WATER-SEDIMENT INTERFACE. ONE PROFILE WAS SURVEYED ALONG ABOUT 2 MI OF THE NIAGARA RIVER ABOVE NIAGARA-ON-THE-LAKE. THIS RECORD SHOWS THE STRONG REFLECTION FROM THE EAST BANK OF THE RIVER AS WELL AS A STRONG INDICATION OF A SAND AND MUD BOTTOM. SOME PROMINENT RIDGES ARE REVEALED WHICH, FROM THEIR SHADOW REGION, MAY BE 8-10 FT HIGH. 20 OTHER PROFILES WERE SURVEYED IN LAKE ONTARIO OFF THE MOUTH OF THE NIAGARA RIVER. THESE RECORDS ARE SHOWN WITH AN INTERPRETATION AS TO BOTTOM MATERIALS AND A CORRELATION WITH DATA FROM CORING STATIONS AND HYDROGRAPHIC CHARTS;

124 DONELAN, MARK A.;
THE CCIW NIAGARA BAR MICROMETEROLOGICAL PROJECT;
(1972) IFYGL B NO 4, PP21-22,
CANADA; PROGRAMS; RESEARCH; IFYGL; MEASUREMENT; METEOROLOGY;
IFY-B4; GCODE5;

125 DUNST, RUSSELL C.; BORN, STEPHEN M.; UTTORMARK, PAUL D.; SMITH, STEPHEN A.; NICHOLS, STANLEY A.; PETERSON, JAMES O.; KNAUER, DOUGLAS R. SERNS, STEVEN L.; WINTER, DONALD R.; WIRTH, THOMAS L.;
SURVEY OF LAKE REHABILITATION TECHNIQUES AND EXPERIENCES;

(1974) WISCONSIN. DEPT. OF NATURAL RESOURCES. TECHNICAL BULLETIN NO. 75. PP. 179.;
LAKES; REHABILITATION; SEDIMENTATION; NUTRIENT REMOVAL; DREDGING; NUTRIENTS; MANAGEMENT; EUTROPHICATION; WATER LEVELS; CURRENTS; HABITAT; ALGICIDES; HERBICIDES; METHODS;
WI-NF-T875; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
EXCESSIVE EUTROPHICATION OF LAKES IS A SERIOUS INTERNATIONAL PROBLEM. THERE HAS BEEN A GREAT NEED FOR A COMPREHENSIVE INFORMATION SOURCE USABLE IN DEVELOPING FUTURE REHABILITATION/PROTECTION PROGRAMS. THIS STATE-OF-THE-ART REVIEW REPRESENTS AN ATTEMPT TO DELINEATE THE ACCOMPLISHMENTS OF LAKE RESTORATION-RELATED ACTIVITIES WORLDWIDE. INFORMATION WAS ACQUIRED THROUGH EXTENSIVE MAIL SURVEY (ABOUT 6,000 ENTRIES), COOPERATION OF SEVERAL INTERNATIONAL JOURNALS/NEWSLETTERS, AND A SYSTEMATIC LITERATURE SEARCH INCLUDING FOREIGN AS WELL AS DOMESTIC MATERIALS. THE CONTENTS OF THIS REPORT CONSISTS OF FIVE MAJOR DIVISIONS; 1) IDENTIFICATION, DESCRIPTION AND PRESENT UTILITY OF THE VARIOUS TECHNIQUES, 2) COMPILATION AND DESCRIPTION OF INDIVIDUAL PAST AND/OR ONGOING RESTORATION EXPERIENCES (ALMOST 600 ACCOUNTS), 3) PROJECT METHODOLOGY, 4) NAME AND ADDRESS OF PEOPLE PROVIDING PERTINENT INFORMATION (OVER 300 RESPONDENTS), AND 5) LITERATURE REFERENCES (MORE THAN 600 DOCUMENTS);

126 DUTKA, BERNARD J.; CHAU, ALFRED S. Y.; COBURN, JOHN A.;
RELATIONSHIP BETWEEN BACTERIAL INDICATORS OF WATER POLLUTION AND FECAL STEROLS;
(1974) WATER RESEARCH, 8:1047-1055;
BACTERIA; POLLUTION; METHODS; BIOASSAY; FECAL COLIFORMS;
CAN-CCIW-CR-7; GCODE1; GCODE5; GCODE7; GCODE4B1T9;

127 DUTKA, BERNARD J.; SWITZER-HOUSE, KAREN D.;
DISTRIBUTION OF MUTAGENS AND TOXICANTS IN LAKE ONTARIO WATERS AS ASSESSED BY MICROBIOLOGICAL PROCEDURES;
(1978) J GREAT LAKES RES 4(2):237-241,
MICROBIOLOGY; METHODS; BACTERIA; TOXICITY;
7912; GCODE5A;
WATER SAMPLES COLLECTED FROM INSHORE AND OFFSHORE WATERS IN LAKE ONTARIO, TORONTO WATERFRONT AND HAMILTON BAY WERE TESTED FOR MUTAGENIC ACTIVITY (AMES TEST) AND PRESENCE OF ACUTE TOXICANTS (SPIRILLUM VOLUTANS TEST. DATA INDICATE MANY INSHORE WATERS CONTAIN MUTAGENIC COMPOUNDS WHICH CAUSE REVERSION OF SALMONELLA TESTER STRAIN TA 1535. THE MAJORITY OF SAMPLES TESTED DID NOT CONTAIN ACUTE TOXICANTS BASED ON THE SPIRILLUM VOLUTANS TEST.;

128 EADIE, BRIAN J.; ROBERTSON, ANDREW;
AN IFYGL CARBON BUDGET FOR LAKE ONTARIO;
(1976) J. GREAT LAKES RESEARCH. VOL. 2, NO. 2, PP. 307-323.;
CARBON; CARBON DIOXIDE; MATHEMATICAL MODELS;
6933; GCODE5;
A CARBON BUDGET WAS PRODUCED FOR EACH MONTH OF THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES (IFYGL) YEAR (APRIL 1972 TO MARCH 1973) TO DETERMINE THE IMPORTANCE OF THE VARIOUS SOURCES AND SINKS OF CARBON. MAJOR SOURCES WERE FOUND TO BE CO2 WHICH WAS FIXED IN ORGANIC MATTER DURING PRIMARY PRODUCTION AND INORGANIC CARBON IN TRIBUTARY STREAMS, ESPECIALLY THE NIAGARA RIVER. THE MAJOR SINKS WERE FOUND TO BE INORGANIC CARBON OUTFLOW AT THE ST. LAWRENCE RIVER AND NET CO2 GAS EXCHANGE BETWEEN THE INORGANIC CARBON POOL AND THE ATMOSPHERE. INFLOW AND OUTFLOW OF ORGANIC MATTERS IN RIVERS, SEDIMENTATION OF ORGANIC AND INORGANIC MATTER, GROUND WATER TRANSPORT, AND MUNICIPAL AND INDUSTRIAL PERTURBATIONS ACCOUNTED IN TOTAL FOR LESS THAN 10% OF THE ANNUAL BUDGET. THE LAKE HAD AN INVENTORY OF APPROXIMATELY 4.0X10 TO THE TENTH POWER KG OF INORGANIC CARBON AND APPROXIMATELY AN ORDER OF MAGNITUDE LESS ORGANIC CARBON. THE RIVERBORNE FLUX OF INORGANIC CARBON OF 0.5X10 TO THE 10TH POWER WAS 13% OF THE LAKE'S INVENTORY, ASSUMING COMPLETE MIXING; A MINIMUM MEAN RESIDENCE TIME OF 6 YEARS CAN BE CALCULATED FROM THAT INVENTORY. THE SEASONAL CYCLE INHERENT IN THE FIXATION OF CARBON IN PRIMARY PRODUCTION WAS PRIMARILY BALANCED BY A COMPLEMENTARY SEASONAL CYCLE IN THE AIR-LAKE CO2 GAS EXCHANGE SYSTEM. THE LAKE ACTS AS A SINK FOR CO2 GAS IN THE WARM MONTHS WHEN PRIMARY PRODUCTIVITY IS HIGHEST AND AS A SOURCE OF CO2 IN THE COLDER PART OF THE YEAR. THE IFYGL YEAR HAD HIGHER THAN NORMAL RATES OF WATER FLOW, BUT THIS DOES NOT APPEAR TO HAVE

PERTURBED THE INORGANIC CARBON SYSTEM. A COMPARISON OF IFYGL CARBON BUDGET RESULTS WITH CORRESPONDING ESTIMATES CALCULATED FOR A TYPICAL YEAR FROM HISTORICAL DATA SHOWS NO MAJOR DIFFERENCES.;

129 ECKERT, THOMAS H.; HANLON, JOHN R.;
FISHERIES STUDIES ALONG THE ST. LAWRENCE RIVER;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT; BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP61-93;
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NY-US-FF-SL; GCODE7;

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5111; US-FCS-F1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

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WATER; POLLUTION; LEGISLATION;
IJC-RA-R-77-C1; GCODE6; GCODE1; GCODE2; GCODE3; GCODE4;

132 EL-SHAARAWI, ABDEL H.; QURESHI, ANSAR A.; DUTKA, BERNARD J.;
STUDY OF MICROBIOLOGICAL AND PHYSICAL PARAMETERS IN LAKE ONTARIO ADJACENT TO THE NIAGARA RIVER;
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CAN-CCIW-O-1; GCODE5A4;
STUDIES OF THE NIAGARA RIVER, AS A POINT SOURCE INPUT INTO LAKE ONTARIO WERE MADE USING VARIOUS MICROBIOLOGICAL AND PHYSICAL PARAMETERS, IN APRIL, JUNE AND OCTOBER, 1974. ANALYSIS OF THE DATA SUGGESTED THE EXISTENCE OF A HIGH POSITIVE ASSOCIATION BETWEEN THESE PARAMETERS. IN ADDITION, HIGH HORIZONTAL VARIABILITY BETWEEN SAMPLING STATIONS WAS FOUND IN 3 STUDIES. ALTHOUGH VERTICAL VARIABILITY WAS NOT STATISTICALLY SIGNIFICANT IN APRIL, SOME PARAMETERS SHOWED VERTICAL HETEROGENEITY DURING JUNE AND OCT. AN EXPLANATION FOR THE VARIABILITY OF MICROBIOLOGICAL PARAMETERS IN TERMS OF THE PHYSICAL PARAMETERS IS GIVEN, USING A BACKWARD ELIMINATION PROCEDURE. A SIMPLE MODEL WAS DEVELOPED TO EXPLAIN THE VARIABILITY IN THE MICROBIOLOGICAL PARAMETERS IN TERMS OF CHANGES IN WATER DENSITY.;

133 EMBODY, G. C.;
STOCKING POLICY FOR THE STREAMS, LAKES AND PONDS OF THE ERIE-NIAGARA WATERSHED, EXCLUSIVE OF LAKE ERIE;
(1929) NY STATE CONSERVATION DEPARTMENT. A BIOLOGICAL SURVEY OF THE ERIE-NIAGARA SYSTEM. PP19-38;
FISH STOCKING; FISH; TEMPERATURE; SALMO; SALMO TRUTTA; SALVELINUS FONTINALIS; SALMO GAIRDNERI; MICROPTERUS DOLOMIEUI; MICROPTERUS SALMOIDES;
GCODE5A4T355; GCODE4G5T252; GCODE4G5T2; GCODE4G5T1; GCODE4G3T7; GCODE4G3T6; GCODE4G3T4; GCODE4G4T3; GCODE4G2T4;

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ATLAS OF REGIONAL PLANS AND PROGRAMS;
( ) ERIE AND NIAGARA REGIONAL PLANNING BOARD, UPDATED PERIODICALLY;
DEVELOPMENT PLANNING; POPULATION ESTIMATE; LAND USE; WATER QUALITY; SEWERS; MAPS; WATER SUPPLY; RECREATION; HOUSING CHARACTERISTICS; WASTE TREATMENT;
ENCRP-2; GCODE4G5; GCODE5A4T3; GCODE5B2;

135 ERIE AND NIAGARA COUNTIES REGIONAL PLANNING BOARD UTILITIES COMMITTEE;

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ENCRP-UC-MS-2; GCODE5B4T2; GCODE5B4T4; GCODE5B4T2; GCODE5B2T1; GCODE5B2T3; GCODE5B2T4; GCODE5A4T3S5; GCODE5A4T3S16; GCODE5A4T3S17; GCODE5A4T3S4; GCODE5A4T3S1; GCODE4G5T3; GCODE4G5T2; GCODE4G3T8; GCODE4G5T1; GCODE4G3T7; GCODE4G3T4;

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US-FCS-P1972; GCODE6; GCODE7;

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(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 32P;
HYDROLOGY; PRECIPITATION; RUNOFF DRAINAGE; WATER SUPPLY; WATER QUALITY; GROUND WATER;
SLE-ST5; GCODE5D4; GCODE5D5; GCODE7; GCODE5D4T1;
THE WATER RESOURCES PICTURE OF THE ST LAWRENCE RIVER-EASTERN LAKE ONTARIO SHORELINE IS DOMINATED BY THE MASSIVE, RELATIVELY CONSTANT VOLUME OF FLOW OF THE GREAT LAKES/RIVER SYSTEM. INPUTS INTO THE STUDY AREA FROM PRECIPITATION ARE LOW, FOR NY STATE, AND THE CONTRIBUTION FROM LARGE TRIBUTARY STREAMS IS MINOR - EVEN THOUGH THEY ORIGINATE IN SOME OF THE HIGHEST PRECIPITATION AREAS OF THE STATE. THE TRIBUTARIES GENERALLY CONTAIN WATER OF LOWER QUALITY, HAVE A MORE WIDELY FLUCTUATING REGIME AND RELATIVELY SMALL VOLUME. THERE ARE NO EXTENSIVE GROUNDWATER AQUIFERS IN THE STUDY AREA WHICH IS HIGHLY PRODUCTIVE. WHERE GROUNDWATER YIELDS ARE HIGH, WATER QUALITY MAY BE SUSPECT BECAUSE OF A RELATIVELY DIRECT CONNECTION BETWEEN SURFACE WATER AND GROUNDWATER. THE ST LAWRENCE RIVER VALLEY AND ITS VICINITY IS A TECTONICALLY ACTIVE AREA, TRAVERSED BY INTRUSIVE IGNEOUS MASSES AND THE SCENE OF HISTORICAL EARTHQUAKES OF MAJOR DIMENSIONS, CONTINUING UPLIFT OF THE SHORELINE AND ALONG-SHORE TRANSPORT OF BEACH MATERIAL ARE WORKING TO CHANGE THE CHARACTER AT LEAST OF SOME SHORELINES IN THE SOUTHERN PART OF THE STUDY AREA. THE FLOW OF THE ST LAWRENCE IS SEVERAL TIMES GREATER THAN THE PROJECTED DEMAND FOR WATER OF THE MUNICIPALITIES AND INDUSTRIES IN THE AREA. ANY RECOMMENDATION TO DEVELOP UPLAND SOURCES OF STORAGE DO NOT APPEAR JUSTIFIED. STRINGENT MEASURES TO PROTECT THE STILL HIGH QUALITY OF THE ST LAWRENCE RIVER WATER BY ADVANCED WASTE TREATMENT IN THE GREAT LAKES BASIN AND STRICT INTERNATIONAL SURVEILLANCE SHOULD HAVE HIGH PRIORITY;

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REMOTE SENSING SATELLITE; RIVERS ; MODEL STUDIES; PLUMES; CHLOROPHYLL; TURBIDITY;
GCODE5; GCODE5A4T3; CAN-CCIW-CR-8;
STUDIES IN THE LAKE ONTARIO BASIN ARE DESIGNED TO PROVIDE INPUT FOR MODELS OF RIVER BASIN DISCHARGE AND MACRO-SCALE FEATURES OF LAKE CIRCULATION. LAKE STUDIES APPEAR TO REQUIRE HIGH ALTITUDE IMAGERY TO RECORD THE DYNAMIC FEATURES OF LAKE ONTARIO SO THAT ERTS-1 DATA MAY BE INTERPRETED. LAND AREA STUDIES REQUIRE INPUT OF SOIL MOISTURE, LAND USE AND SOIL-SEDIMENT-GEOMORPHOLOGY MEASUREMENTS SOME OF

WHICH APPEAR TO BE AVAILABLE, ON A REGIONAL SCALE FROM ERTS-1 PRODUCTS;

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SLE-TN5; GCODE5; GCODE7;

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IFY-84; GCODE5;

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MERCURY USES IN CANADA AND THEIR POSSIBLE HAZARDS AS SOURCES OF MERCURY
CONTAMINATION;
(1970) ENVIRONMENTAL POLLUTION. VOL. 1. PP119-131;
MERCURY; POLLUTION; INDUSTRIAL SEWAGE TREATMENT;
2566; GCODE1; GCODE2; GCODE3; GCODE4; GCODE6;
DURING THE PAST TEN YEARS MERCURY CONSUMPTION HAS SHOWN A STRONG UPWARD TREND IN
CANADA. THE MAJOR PROPORTION OF THIS INCREASE CAN BE ACCOUNTED FRR BY THE
CHLOR-ALKALI INDUSTRY, FROM WHICH NEARLY 200,000 LB (90,000 KG) OF MERCURY ARE
RELEASED INTO THE ENVIRONMENT EACH YEAR. MOST OF THIS MERCURY FINDS ITS WAY TO
WATERCOURSES EXPOSING AQUATIC ECOSYSTEMS WHERE MERCURY IS KNOWN TO ACCUMULATE.
THE USE OF MERCURY COMPOUNDS FOR SLIME CONTROL IN THE CANADIAN PULP INDUSTRY IS
DECREASING, BUT IN ONE CASE ELEVATED MERCURY LEVELS IN FISH WERE TRACED BACK TO
SUCH A SOURCE. ALSO DECREASING IS THE USE OF SEED-DRESSINGS CONTAINING MERCURY,
ALTHOUGH THIS USE OF MERCURIALS IS STILL CONSIDERABLE, AND IN VIEW OF FINDINGS
IN OTHER COUNTRIES ELEVATED MERCURY LEVELS IN SEED-EATING BIRDS AND THEIR
PREDATORS MUST BE EXPECTED. ELEVATED LEVELS OF MERCURY WERE FOUND IN PHEASANTS
AND PARTRIDGES COLLECTED IN SOUTHERN ALBERTA WHERE MERCURY SEED-DRESSINGS ARE
EXTENSIVELY USED;

145 FISHER, DONALD W.;
PRE-CLINTON ROCKS OF THE NIAGARA FRONTIER - A SYNOPSIS;
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DREDGE;
2590; GCODE5;
NONE OF SEVERAL SAMPLERS COMPARED IN LIMITED TESTS IN LAKE ONTARIO GAVE

REALISTIC ESTIMATES OF BENTHOS IN ALL SUBSTRATES ENCOUNTERED. THE PONAR AND SHIPEK GRABS, THE ONLY SAMPLERS THAT FUNCTIONED IN GRAVEL, CAME CLOSEST TO ALL-SEDIMENT SAMPLERS. IN SAND, HOWEVER, THE FRANKLIN-ANDERSON GRAB APPEARED TO BE MUCH MORE EFFICIENT THAN EITHER OF THESE TWO SAMPLERS. IN MUD THE EKMAN GRABS GAVE THE HIGHEST MEAN NUMBERS OF ANIMALS PER SQUARE M. IN TRIALS IN LAKE WINNIPEG PROFUNDAL MUD, HAND-TAKEN DIVER'S CORE SAMPLES BEING USED AS A QUANTITATIVE STANDARD, ONLY THE FISHERIES RESEARCH BOARD MULTIPLE CORER AND THE STANDARD EKMAN GRAB GAVE QUANTITATIVE RESULTS FOR TOTAL MACROBENTHOS. HOWEVER, THE MULTIPLE CORER COLLECTED SIGNIFICANTLY FEWER CHIRONOMIDS, AND THE STANDARD EKMAN GRAB SIGNIFICANTLY FEWER OLIGOCHAETES, THAN DID THE DIVER'S CORES. THERE WERE INDICATIONS THAT THE TALL EKMAN GRAB WAS EITHER NOT TALL ENOUGH OR TOO HEAVILY WEIGHTED FOR USE IN SOFT SEDIMENTS AND THAT A SMALL IMPROVEMENT IN DESIGN COULD MAKE BOTH THIS AND THE STANDARD EKMAN MORE EFFICIENT. MOST OF THE SAMPLERS APPARENTLY SAMPLED SOME GROUPS OF ORGANISMS MUCH BETTER THAN OTHERS. NEITHER THE PONAR GRAB NOR THE TALL WEIGHTED EKMAN GRAB SAMPLED THE CHIRONOMID OR OLIGOCHAETE POPULATIONS SATISFACTORILY. HOWEVER, BOTH GRABS INDICATED DENSITIES OF SPHAERIIDS NOT SIGNIFICANTLY DIFFERENT FROM THE DIVER'S SAMPLES;

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IFYGL PHYSICAL DATA COLLECTION SYSTEM: DESCRIPTION OF ARCHIVED DATA;
(1976) US DEPT OF COMMERCE NOAA TECHNICAL REPORT EDS 15, 175P;
DATA PROCESSING; METHODS; INSTRUMENTS; MEASUREMENT; TEMPERATURE; WIND; VELOCITY; CURRENTS;
US-CN-EDS-15; GCODES;
THIS REPORT DESCRIBES THE DATA OBTAINED BY THE PHYSICAL DATA COLLECTION SYSTEM, A NETWORK OF TOWERS, BUOYS, AND LAND STATIONS USED DURING THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES (IFYGL) IN 1972-73 FOR LIMNOLOGICAL AND METEOROLOGICAL MEASUREMENTS ON LAKE ONTARIO. SENSORS USED, CALIBRATION PROCEDURES, AND DATA PROCESSING TECHNIQUES ARE DISCUSSED, AND INVENTORIES ARE GIVEN OF ARCHIVED DATA;

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IFYGL PHYSICAL DATA COLLECTION SYSTEM: INTERCOMPARISON DATA;
(1975) US DEPT OF COMMERCE NOAA ENVIRONMENTAL DATA SERVICE NOAA TECHNICAL MEMORANDUM EDS CEDDA-3, MP;
DATA PROCESSING; MEASUREMENT; MATHEMATICAL MODELS; TEMPERATURE; VELOCITY; WIND; CURRENTS;
US-CN-ED-TM-C3; GCODES;
DURING IFYGL 1972-73, 14 BUOYS AND TOWERS (EQUIPPED WITH AUTOMATIC RECORDING DEVICES) WERE DEPLOYED IN LAKE ONTARIO AS THE MAJOR SEGMENT OF THE PHYSICAL DATA COLLECTION SYSTEM (PDCS). DATA FROM BUOY INTERCOMPARISONS BEFORE DEPLOYMENT INDICATE THAT MEASUREMENTS BY THE PDCS SENSORS WERE ACCURATE. DURING THE FIELD YEAR, THE BUOY SYSTEM WAS COMPARED WITH SENSORS ABOARD THE US S/V (SURVEY VESSEL) JOHNSON, AND THE DATA OBTAINED CONFIRMED THE RELIABILITY OF THE AIR- AND WATER-TEMPERATURE SENSORS. THE WIND-SPEED AND WIND-DIRECTION SENSORS APPARENTLY FUNCTIONED PROPERLY THROUGHOUT THE FIELD YEAR, BUT THE QUALITY OF CURRENT SPEED, CURRENT DIRECTION, AND DEW-POINT DATA DETERIORATED AFTER DEPLOYMENT;

149 FREITAG, DEAN R.;
APPLICATION OF ICE ENGINEERING AND RESEARCH TO GREAT LAKES PROBLEMS;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP131-138;
ICE; ENGINEERING; RESEARCH; ICE CONTROL; ICE CONDITIONS; REMOTE SENSING;
US-FCS-P1972; GCODES;
THE COLD REGIONS RESEARCH AND ENGINEERING LABORATORY (CRREL) CONDUCTS RESEARCH, STUDIES, AND INVESTIGATIONS ON PHYSICAL PHENOMENA ASSOCIATED WITH TEMPERATURES NEAR OR BELOW THE FREEZING POINT OF WATER. ALTHOUGH IN THE PAST MUCH OF THE RESEARCH HAS BEEN SPONSORED BY THE MILITARY, THE BREADTH OF THE RESEARCH PROGRAM HAS BEEN AND REMAINS QUITE LARGE. THERE ARE STUDIES OF SNOW CONTROL AND REMOVAL, ICE ENGINEERING, FOG DISPERSAL, FROST EFFECTS IN SOIL, INTERPRETATION OF SATELLITE IMAGERY AND FORECASTING DATES OF FREEZE UP, ICE THICKNESS, ETC. A NUMBER OF BASIC SCIENCE STUDIES SUPPORT THIS WORK, FOR EXAMPLE, RESEARCH ON THE BASIC CRYSTALLOGRAPHY OF ICE, PALEOCLIMATOLOGY, GEOPHYSICS, AND THE ECOLOGY OF THE TUNDRA BIOME. MUCH OF THE EXPERTISE ACQUIRED BY CRREL HAS DIRECT APPLICATION TO CURRENT PROBLEMS OF THE GREAT LAKES REGION. THIS HAS RECENTLY BEEN RECOGNIZED

BY THE CORPS OF ENGINEERS, AND THE LABORATORY IS ACTIVE IN THE STUDY OF THE EXTENSION OF THE NAVIGATION SEASON ON THE GREAT LAKES. THE SPECIFIC STUDIES BEING PURSUED ON THAT PROJECT INCLUDE A STUDY OF POLLUTION PATTERNS FROM SATELLITE-BASED IMAGERY AND ASSISTANCE IN THE DEVELOPMENT OF THE BUBBLE SYSTEMS FOR ICE CONTROL.;

150 FRICK, HAROLD C.;
ECONOMIC ASPECTS OF THE GREAT LAKES FISHERIES OF ONTARIO;
(1965) FISHERIES RESEARCH BOARD OF CANADA. BULLETIN NO. 149. PP. 160.;
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CAN-FRS-FRB-B149; GCODE1; GCODE3; GCODE4; GCODE5; GCODE6;

151 GASIEWICZ, THOMAS A.; DINAN, FRANK J.;
CONCENTRATION OF MERCURY IN THE MANUFACTURE OF FISH PROTEIN CONCENTRATE BY ISOPROPYL ALCOHOL EXTRACTION OF SHEEPSHEAD AND CARP;
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MERCURY; FISH PROTEIN CONCENTRATE; APLODINOTUS GRUNNIENS; CYPRINUS; FISH; 3017; GCODE4E3; GCODE4E4; GCODE46; GCODE5A4T3;
LEVELS OF MERCURY IN BOTTOM FEEDING FRESHWATER FISH AND THEIR CORRESPONDING FISH PROTEIN CONCENTRATES HAVE BEEN DETERMINED AND FOUND TO CORRELATE WITH A FISH: FISH PROTEIN CONCENTRATE ENRICHMENT FACTOR OF 5. THIS FINDING INDICATES THAT NO MERCURY IS EXTRACTED FROM THE FISH USED IN THIS STUDY DURING THE CONCENTRATE MANUFACTURE VIA ISOPROPYL ALCOHOL EXTRACTION, AND FURTHER SUGGESTS THAT ONLY FISH OF LOW INITIAL MERCURY CONCENTRATION MAY BE USED AS STARTING MATERIAL IN THIS PROCESS IF THE RESULTANT FISH PROTEIN CONCENTRATE (FPC) IS NOT TO EXCEED THE MAXIMUM ALLOWABLE MERCURY CONCENTRATION LEVEL.;

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REMOTE SENSING; WATER QUALITY; NASA; US; REGULATORY AGENCY; PROGRAMS;
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COMMUNITY STRUCTURE; PRIMARY PRODUCTIVITY; SECONDARY PRODUCTIVITY; PHYTOPLANKTON; FISH; LARVAE; FOOD; PLANTS; WATER QUALITY; BENTHOS; AVES; INSECTA, MAMMALIA; AMPHIBIANS; REPTILIA; PERIPHYTON; ZOOPLANKTON; ENDANGERED SPECIES;
NY-US-FF-SL; GCODE7;

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PLANT COMMUNITIES ALONG THE ST. LAWRENCE RIVER SHORELINE IN NEW YORK STATE;
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NY-US-FF-SL; GCODE7;

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COASTAL WETLANDS ALONG LAKE ONTARIO AND ST LAWRENCE RIVER IN JEFFERSON COUNTY, NY;
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NY-US-ESF-1; GCODE5D4; GCODE5D5;

156 GEIS, JAMES W; LUSCOMB, SCOTT;
NATURAL VEGETATION;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 20P;
VEGETATION; PLANTS; WETLANDS; HABITAT;
SLE-ST4; GCODE5C4; GCODE5D5; GCODE7;
AN INVENTORY OF NATURAL PLANT COMMUNITIES WAS CONDUCTED ON 407,744 ACRES OF LAND ALONG THE SHORELINE OF LAKE ONTARIO AND THE ST LAWRENCE RIVER IN JEFFERSON AND ST LAWRENCE COUNTIES, NY. 6 MAJOR VEGETATIONAL UNITS, INCLUDING 16 COVER TYPES WERE RECOGNIZED AND LOCATED ON A 1:24,000 SCALE MAP. OVER 45% OF THE AREA (52% IN JEFFERSON COUNTY AND 37% IN ST LAWRENCE COUNTY) IS CURRENTLY IN SOME FORM OF AGRICULTURAL OR DEVELOPED LAND USE SYSTEM. SUCCESSIONAL FIELDS, DEVELOPING AFTER AGRICULTURAL ABANDONMENT, OCCUPY 22% OF THE STUDY AREA. ALTHOUGH FORESTS COVER 10% OF THE AREA IN JEFFERSON COUNTY AND 23% IN ST LAWRENCE COUNTY, EVIDENCE OF PAST USE AND ABUSE IS ABUNDANTLY PRESENT. RELATIVELY UNDISTURBED FORESTS ARE RARE. FRAGILE COMMUNITIES WHICH ARE EXTREMELY SENSITIVE TO HUMAN IMPACT OCCUR ON ROCK OUTCROPS, WETLANDS AND SAND DUNES, ACCOUNTING FOR 13.2, 4.0, AND 0.2%, RESPECTIVELY, OF THE STUDY AREA. A TOTAL OF 20 UNIQUE VEGETATIONAL AREAS WERE IDENTIFIED IN LOCATIONS WHERE RARE OR ENDANGERED SPECIES OR COVER TYPES PERSIST. OTHER COVER TYPES, ALTHOUGH NOT UNIQUE, WERE CONSIDERED OF HIGH IMPORTANCE FOR THE MAINTENANCE OF THE ENVIRONMENTAL QUALITY OF THE REGION. THESE AREAS MUST BE LOCATED BY CAREFUL ANALYSIS OF THE VEGETATION MAP; HOWEVER, CERTAIN PARAMETERS ASSIST IN THEIR IDENTIFICATION. HIGH BIOLOGICAL IMPORTANCE SHOULD BE ASSIGNED TO AREAS OF HIGH BIOLOGICAL PRODUCTIVITY; OF FRAGILE PLANT COMMUNITIES; OF STABLE SPECIES COMPOSITION WHICH REQUIRE LONG PERIODS OF NATURAL SUCCESSION FOR REPLACEMENT; AND OF LOCALLY UNIQUE CHARACTER SO AS TO PROVIDE HIGHLY DIVERSE HABITATS WHICH RESIST CATASTROPHIC CHANGE AND ENCOURAGE WILDLIFE POPULATIONS. USERS OF THIS REPORT ARE ENCOURAGED TO: (1) EVALUATE NATURAL PLANT COMMUNITY PATTERNS PRIOR TO DEVELOPMENT SO AS TO MAINTAIN HABITAT DIVERSITY; (2) PRESERVE WHERE POSSIBLE LARGE PORTIONS OF THE UNIQUE AREAS TABULATED IN THIS REPORT; (3) PRESERVE WHERE POSSIBLE COMMUNITIES WHICH REQUIRE THE LONGEST PERIODS OF NATURAL SUCCESSION FOR REESTABLISHMENT; (4) AVOID DEVELOPING IN COVER TYPES WHICH PROVIDE PHYSICAL STABILITY AND BIOLOGICAL CONTINUITY TO FRAGILE SUBSTRATA; AND (5) DEVELOP IN THOSE AREAS OF NATURAL VEGETATION WHICH ARE MOST READILY REPLACED BY NATURAL SUCCESSION, IF THE ENGINEERING CONSIDERATIONS OF THESE SITES ARE CONSISTENT WITH DEVELOPMENT PLANS;

157 GENESEE STATE PARK COMMISSION;
LAKESIDE BEACH STATE PARK. MASTER DEVELOPMENT PLAN;
(1975) GENESEE STATE PARK COMMISSION, 36 X 24 IN;
MAPS; RECREATION;
M9; GCODE5C2;

158 GENESEE STATE PARK AND RECREATION COMMISSION;
OAK ORCHARD MARINE PARK;
(   ) GENESEE STATE PARK AND RECREATION COMMISSION, 24 X 36 IN;
RECREATION; MAPS;
M6; GCODE5B413; GCODE5B4;

159 GENESEE/FINGER LAKES REGIONAL PLANNING BOARD;
THE LAKE ONTARIO SHORELINE, AN ENVIRONMENTAL ACTION PROGRAM;
(1972) GENESEE/FINGER LAKES REGIONAL PLANNING BOARD TECHNICAL STUDY SERIES REPORT NO. 13, 100P;
DEVELOPMENT PLANNING; COASTAL ZONE; REGULATION; LAND USE;
GFL-TS13; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3;
AN ENVIRONMENTAL ACTION PROGRAM HAS BEEN DEVELOPED FOR THE 90 MI OF LAKE ONTARIO SHORELINE WITHIN THE PHYSICAL LIMITS OF THE GENESEE/FINGER LAKES REGION. THE PROGRAM CONSISTS OF DEFINITION OF PROBLEMS, AN ANALYSIS OF PAST ACCOMPLISHMENTS, CONSIDERATION OF FUTURE NEEDS, AND A PROGRAM OUTLINE FOR IMMEDIATE AND FUTURE ACTION. PAST AND CURRENT POLICIES DIRECTED TOWARD LAKESHORE IMPROVEMENT ARE ANALYZED. AN EARLY ACTION PROGRAM TO DEAL WITH IMMEDIATE PROBLEMS IS RECOMMENDED, TOGETHER WITH A LONG RANGE PROGRAM FOR IMPLEMENTATION. A GENERAL DEVELOPMENT PROGRAM LISTS AND MAKES RECOMMENDATIONS FOR DEVELOPMENT ACTIVITIES IN 4 BASIC CATEGORIES: PLANNING PROJECTS, REGULATORY CONTROLS, ENVIRONMENTAL

QUALITY PROJECTS AND ADMINISTRATION STANDARDS. APPENDIXES LIST PRESENT FUNCTIONS OF FEDERAL AND STATE LEVEL AGENCIES, AND SUGGESTED DISTRICT REGULATIONS FOR A SHORELINE COMMERCIAL-RECREATION DISTRICT;

160 GENESSE/FINGER LAKES REGIONAL PLANNING BOARD;
THE LAKE ONTARIO SHORELINE: A REGIONAL OVERVIEW OF ENVIRONMENTAL PROBLEMS;
(1971) GENESEE/FINGERLAKES REGIONAL PLANNING BOARD TECHNICAL STUDY SERIES REPORT NO. 12, PP124;
COASTAL ZONE; LAND USE; DEVELOPMENT PLANNING; POLLUTION;
GFL-TS12; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3;
THE REPORT PROVIDES A BROAD PRELIMINARY OVERVIEW OF ENVIRONMENTAL PROBLEMS AFFLICTING THE 90 MI OF THE LAKE ONTARIO SHORELINE FORMING THE NORTHERN BOUNDARY OF THE GENESEE/FINGER LAKES REGION. IT SHOWS THE COMPLEXITIES OF THE ECOLOGICAL, LAND USE, WATER USE AND ECONOMIC PROBLEMS WHICH BESET THE LAKE, BAYS, WETLANDS AND CREEK WATERSHEDS AND THE SHORELINE COMMUNITIES. OPPORTUNITIES FOR A MORE PRODUCTIVE UTILIZATION OF THE LAKESHORE AS A NATURAL RESOURCE ARE DESCRIBED. THE REPORT REVIEWS POLLUTION SOURCES AND WATER QUALITY CONDITIONS; EXAMINES THE RECOMMENDATIONS OF PUBLISHED COMPREHENSIVE PLANNING REPORTS; EXAMINES LAND USE AND WATER USE CONFLICTS; REVIEWS THE STATE OF SCIENTIFIC KNOWLEDGE OF THE LAKESHORE ENVIRONMENTAL PROBLEMS. IT INCLUDES BRIEF SURVEYS OF REGULATIONS INSTITUTED IN THE OTHER STATES TO DEAL WITH SIMILAR SHORELINE AND WETLAND MANAGEMENT PROBLEMS. THE REPORT ENDS WITH BROAD CONCLUSIONS AND RECOMMENDATIONS CONCERNING FUTURE ENVIRONMENTAL PLANNING ACTION.;

161 GIBSON-MACDONALD, NORMA, EDITOR;
GREAT LAKES SURVEILLANCE AND MONITORING;
(1977) IJC, 136P;
MONITORING; WATER QUALITY; REGULATION;
IJC-NO-F76; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;

162 GLADWELL, JOHN S.;
A PROGRAM OF COOPERATIVE WATER RESOURCES RESEARCH AND TRAINING;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP69-77;
WATER; RESEARCH; PROGRAMS; US; REGULATORY AGENCY;
US-FCS-F1972; GCODE6;
THE OFFICE OF WATER RESOURCES RESEARCH ADMINISTERS A PROGRAM OF WATER RESOURCES RESEARCH AS AUTHORIZED BY THE WATER RESOURCES RESEARCH ACT OF 1964, AS AMENDED. 3 PURPOSES OF THE PROGRAM ARE (1) TO DEVELOP THROUGH NEW RESEARCH NEW TECHNOLOGY AND MORE EFFICIENT METHODS FOR RESOLVING LOCAL, STATE, AND NATIONAL WATER RESOURCE PROBLEMS, (2) TO TRAIN WATER SCIENTISTS AND ENGINEERS THROUGH THEIR ON-THE-JOB PARTICIPATION IN RESEARCH WORK, AND (3) TO FACILITATE WATER RESEARCH COORDINATION AND THE APPLICATION OF RESEARCH RESULTS.;

163 GLOOSCHENKO, VALANNE; GLOOSCHENKO, WALTER A.;
EFFECT OF POLYCHLORINATED BIPHENYL COMPOUNDS ON GROWTH OF GREAT LAKES PHYTOPLANKTON;
(1975) CANADIAN JOURNAL OF BOTANY. VOL. 53, NO. 7. PP. 653-659.;
PCB; PHYTOPLANKTON; TOXICITY; ANKISTRODESMUS; SCENEDESMUS; SYNEDRA; NAVICULA; CELL DIVISION; ALGAE; PHOTOSYNTHESIS;
5151; CAN-CCIW-CR7; GCODE4; GCODE5; GCODE6;
POLYCHLORINATED BIPHENYLS (PCBS) HAVE BEEN USED FOR A VARIETY OF INDUSTRIAL APPLICATIONS SINCE 1929 AND THEIR PRESENCE IS NOW WIDESPREAD IN AQUATIC AND TERRESTIAL ECOSYSTEMS. IN THIS STUDY, THREE SPECIES OF GREAT LAKES PHYTOPLANKTON AND ONE COMMON SOIL ALGAE EXHIBITED GROWTH INHIBITION WHEN EXPOSED TO CONCENTRATIONS OF PCB AS LOW AS 1 UG/LITRE WHILE 50 UG/LITRE WAS TOXIC TO ALL CULTURES. PHOTOSYNTHESIS, MEASURED BY NAZE14CO3 UPTAKE WAS ALSO DEPRESSED BY PCB ADDITIONS, BUT E14C UPTAKE PER CELL WAS SIMULATED AT TIMES. OF THE FOUR PCB COMPOUNDS TESTED, AROCLOR 1016 APPEARED LEAST TOXIC AND AROCLOR 1242 WAS THE MOST TOXIC, WHILE AROCLORS 1221 AND 1248 GAVE IMMEDIATE RESPONSES. EXAMINATION OF CELLS BY ELECTRON MICROSCOPY SHOWED DISTORTION OF CHLOROPLAST LAMELLAE AND INCREASED CYTOPLASMIC VACUOLE FORMATION IN ALGAL CULTURES TREATED WITH 50 UG/LITRE PCB. GROSS CELL MORPHOLOGY CHANGES WERE ALSO OBSERVED UNDER THE LIGHT MICROSCOPE. WATER QUALITY CRITERIA RECOMMENDED THAT PERSISTENT ORGANIC CHEMICALS WHICH ARE TOXIC IN CONCENTRATIONS OF 5 UG/LITER OR LESS SHOULD NOT EXCEED

ENVIRONMENTAL LEVELS OF MORE THAN 1/100TH OF THIS AMOUNT. LEVELS OF PCBS IN WATER FROM SEVERAL AREAS OF LAKES ERIE AND ONTARIO CURRENTLY EXCEED THESE CONCENTRATIONS.;

164 GLOOSCHENKO, WALTER A.;
THE EFFECT OF DDT AND DIELDRIN UPON 14C UPTAKE BY IN SITU PHYTOPLANKTON IN LAKES ERIE AND ONTARIO;
(1971) PROCEEDINGS 14TH CONF. ON GREAT LAKES RESEARCH. IAGLR. PP. 219-223;
DDT; DIELDRIN; PHYTOPLANKTON; CARBON 14; IN SITU CULTURING; CHLORINATED HYDROCARBON PESTICIDES; PESTICIDES; TOXICITY; CHLOROPHYLL A; ALGAE;
5831; IGF-C14-1971; GCODE4; GCODE5;
IN SITU STUDIES WERE PERFORMED UPON THE EFFECTS OF DDT AND DIELDRIN TO PHYTOPLANKTON IN LAKE ONTARIO IN MAY 1970 AND LAKE ERIE IN JULY AND OCTOBER 1970. TO WATER SAMPLES, CONCENTRATIONS OF 1, 10, 100 PPB DDT AND DIELDREN (LAKE ERIE ONLY) WERE ADDED. THE RESPONSE OF THE PHYTOPLANKTON WAS MEASURED BY CARBON 14 UPTAKE OVER 5-HR INTERVALS. ON LAKE ONTARIO, 1 PPB DDT WAS SUFFICIENT TO CAUSE A DECREASE OF CARBON 14 UPTAKE BY 12.5 %. ON FOUR STATIONS OCCUPIED IN LAKE ERIE IN JULY, AND THREE OCCUPIED IN OCTOBER, DDT AT 1 PPB CAUSED DECREASES IN CARBON 14 UPTAKE FROM 4.2-26.1% IN JULY AND 1.2-29.1% IN OCTOBER. DIELDRIN DECREASED CARBON 14 UPTAKE TO A GREATER EXTENT. A DECREASE OF 30.7-74.7% WAS FOUND AT 1 PPB IN JULY, AND 9.0-30.4% IN OCTOBER. AT THE HIGHER CONCENTRATIONS USED OF 10, 100 AND 1000 PPB, GREATER REDUCTION OF CARBON 14 WAS NOTICED. THE INHIBITION OF CARBON 14 UPTAKE BY DDT AND DIELDRIN DOES NOT APPEAR TO BE IMPORTANT TO THE GREAT LAKES IN SITU EXCEPT POSSIBLY IN LOCAL AREAS OF HIGH RUN-OFF FROM AGRICULTURAL SOURCES. THE MAJOR PROBLEM APPEARS TO BE CONCENTRATION OF THESE PESTICIDES BY ALGAE AND TRANSFER TO HIGHER TROPHIC LEVELS.;

165 GLOOSCHENKO, WALTER A.;
THE EFFECTS OF ENERGY-RELATED EFFLUENTS ON PRODUCTIVITY, BIOMASS, AND EUTROPHICATION OF THE GREAT LAKES;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY, PP423-431;
PRIMARY PRODUCTIVITY; BIOMASS; EUTROPHICATION; EFFLUENTS; ENERGY; TEMPERATURE; PHYTOPLANKTON;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

166 GLOOSCHENKO, WALTER A.;
PROJECT COPS;
(1972) IFYGL B NO 4, PP14-17;
ORGANIC MATTER; RESEARCH; PROGRAMS; IFYGL; CANADA; CHEMICAL COMPOSITION; CHEMISTRY; BIOLOGY;
IFY-84; GCODE5;

167 GLOOSCHENKO, WALTER A.; MOORE, JAMES E.; MUNAWAR, MOHIUDDIN; VOLLENWEIDER, RICHARD A.;
PRIMARY PRODUCTION IN LAKE ONTARIO AND ERIE: A COMPARATIVE STUDY;
(1974) JOURNAL OF THE FISHERIES RESEARCH BOARD OF CANADA, VOL. 31, NO. 3, PP. 253-263;
PRIMARY PRODUCTIVITY; CHLOROPHYLL-A; PHOTOSYNTHESIS;
GCODE4; GCODE5; 4560;
PRIMARY PRODUCTION VALUES IN LAKE ONTARIO WERE LOW IN WINTER, REACHED A MAXIMUM IN MIDSPRING, DECLINED DURING SUMMER, AND SLIGHTLY INCREASED IN FALL. RATE OF INCREASE OF PRODUCTION FOR INSHORE WATERS (.20 M DEPTH) WAS GREATER ESPECIALLY IN SPRING AND EARLY SUMMER WITH A GREATER MAXIMUM REACHED EARLIER THAN IN OFFSHORE WATERS. ASSIMILATION NUMBERS, MGC FIXED/MG CHLOROPHYLL-A PER HOUR, IN LAKE ONTARIO WERE FAIRLY CONSTANT OVER THE LAKE WITH A YEARLY RANGE OF 1.2-1.6. PRIMARY PRODUCTION SHOWED A LINEAR RELATIONSHIP TO CHLOROPHYLL-A CONCENTRATION, AS ALSO OCCURRED IN LAKE ERIE. LAKE ERIE PRIMARY PRODUCTION VARIED IN ITS THREE BASINS. SEASONALLY, IN THE EASTERN BASIN, PRODUCTION WAS HIGHEST IN SPRING WITH A MIDSUMMER DECLINE, AND SMALL PEAKS IN FALL. THE WESTERN BASIN HAD A MAXIMUM IN MIDSUMMER WHEREAS THE CENTRAL BASIN HAD PEAKS IN LATE SUMMER AND EARLY FALL. ASSIMILATION NUMBERS WERE HIGHEST IN THE WESTERN BASIN (UP TO 3.5 MGC/MG CHLOROPHYLL-A PER HOUR) AND LOWEST IN THE MID-CENTRAL BASIN AND EASTERN BASIN

WITH VALUES OF APPROXIMATELY 1.4 MGC/MG CHLOROPHYLL-A PER HOUR. A DEFINITE WESTERLY INCREASE OF ASSIMILATION NUMBER WAS OBSERVED. UP TO EARLY SUMMER THE TWO LAKES WERE FAIRLY EQUAL IN SURFACE PRODUCTION BUT INTEGRAL PHOTOSYNTHESIS, MGC/MSQUARED PER HOUR WAS HIGHER IN LAKE ONTARIO THAN IN LAKE ERIE. THE SAME WAS VALID IN NOVEMBER AND DECEMBER. IN SUMMER, LAKE ERIE WAS HIGHER IN PRODUCTION ON BOTH A MGC/MEXP3 PER HOUR AND MGC/MSQUARED PER HOUR BASIS. FOR THE PERIOD, APRIL-DECEMBER, LAKE ONTARIO'S TOTAL ESTIMATED YIELD WAS 170 GC/MSQUARED, WHEREAS FOR LAKE ERIE VALUES OF 160, 230, AND 310 GC/MSQUARED WERE FOUND FOR THE EASTERN, CENTRAL, AND WESTERN BASINS, RESPECTIVELY.;

168 GLYNN, DON;
LAKESHORE STROLL MAY INFLUENCE FUTURE OF ICE BOOM;
(1979) NIAGARA GAZETTE, MARCH 25, 1979, 2PP;
ICE CONTROL; IJC;
7905; GCODE4G5; GCODE5A413;

169 GREAT LAKES - ST. LAWRENCE SEAWAY WINTER NAVIGATION BOARD;
ANNUAL REPORT;
(1973) GREAT LAKES - ST. LAWRENCE SEAWAY WINTER NAVIGATION BOARD, 104P;
NAVIGATION SEASON EXTENSION; ICE; NAVIGATION; RESEARCH; ENGINEERING;
METEOROLOGY; ECONOMICS;
GLW-AR1973; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;

170 GREAT LAKES - ST. LAWRENCE SEAWAY WINTER NAVIGATION BOARD;
ANNUAL REPORT;
(1974) GREAT LAKES - ST. LAWRENCE SEAWAY WINTER NAVIGATION BOARD, 100P;
NAVIGATION SEASON EXTENSION; ICE; NAVIGATION; RESEARCH; ENGINEERING;
METEOROLOGY; ECONOMICS;
GLW-AR1974; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;

171 GREAT LAKES - ST. LAWRENCE SEAWAY WINTER NAVIGATION BOARD;
GREAT LAKES - ST. LAWRENCE SEAWAY NAVIGATION SEASON EXTENSION - DRAFT SYSTEM OVERVIEW;
(1977) GREAT LAKES - ST. LAWRENCE SEAWAY WINTER NAVIGATION BOARD. PP. 39.;
NAVIGATION SEASON EXTENSION; NAVIGATION;
GLW-SO-1D; GCODE1; GCODE2; GCODE3; GCODE4, GCODE5; GCODE6; GCODE7;

172 GREAT LAKES BASIN COMMISSION;
CITIZEN'S SUMMARY. GREAT LAKES BASIN PORTION OF 1975 NATIONAL WATER ASSESSMENT;
(1977) GREAT LAKES BASIN COMMISSION. 42PP;
REGULATORY AGENCY; WATER QUALITY; COASTAL ZONE; REGULATION; EROSION;
GLBC-NWA-1975CS; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

173 GREAT LAKES BASIN COMMISSION;
CONFERENCE ON WATER CONSERVATION, DECEMBER 6-7, 1977: HIGHLIGHTS;
(1977) GLBC. CONFERENCE HELD AT THE UNIVERSITY OF MICHIGAN, DECEMBER 6-7, 1977. PP. 94.;
CONSERVATION; WATER; MI; NY; WI; IL; CLIMATIC FACTORS; IRRIGATION; PROGRAMS; FORECASTING; GROUND WATER; MONITORING; REGULATIONS; MANAGEMENT; URBAN RUNOFF; WATER LEVELS; PRECIPITATION; ECOLOGY; CURRENTS; ECONOMICS; LEGISLATION;
GLBC-WCC-1977; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

174 GREAT LAKES BASIN COMMISSION;
FISH;
(1975) GLBC FRAMEWORK STUDY APPENDIX 8, PP293;
FISH; FISHERIES; HABITAT; SPAWNING; SEXUAL MATURITY; COMMERCIAL FISHERIES; MANAGEMENT; WATER LEVELS; REGULATION; LAKE LEVELS; SPECIES DIVERSITY; FISHING; CREEL; RECREATION;
GLBC-FS-8; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;
THIS REPORT PROVIDES INFORMATION ON THE PAST, PRESENT, AND FUTURE DEMAND; ANALYSIS OF THE PRESENT AND FUTURE CAPACITY OF THE RESOURCE BASE TO MEET THESE DEMANDS; ASSESSMENT OF THE PROBLEMS INVOLVED; AND GENERAL APPROACHES TO ACHIEVE SOLUTIONS THAT WILL CONTRIBUTE MAXIMUM PUBLIC BENEFITS. FISHERY MANAGEMENT NEEDS HAVE BEEN ANALYZED AND INCLUDE THE PHILOSOPHY OF MANAGEMENT UP TO THE PRESENT

TIME. WHILE THE INLAND BASINS OF THE GREAT LAKES REGION ARE INCLUDED IN THIS REPORT, THE MAJOR EMPHASIS IS PLACED ON THE GREAT LAKES THEMSELVES BECAUSE THEIR SHEER SIZE AND FISHERY POTENTIAL WILL DOMINATE THE FUTURE SPORT AND COMMERCIAL FISHERY OF THE BASIN. THIS REPORT WILL DISCUSS THE RAPIDLY CHANGING CONDITIONS ON THE GREAT LAKES.;

175 GREAT LAKES BASIN COMMISSION;
GREAT LAKES BASIN FRAMEWORK STUDY EXECUTIVE SUMMARY;
(   ) GREAT LAKES BASIN FRAMEWORK STUDY. 31PP;
RECREATION; WATER QUALITY; LAND USE;
GLBC-FS-E; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

176 GREAT LAKES BASIN COMMISSION;
INVENTORY OF LAND USE AND LAND USE PRACTICES IN THE UNITED STATES GREAT LAKES BASIN VOL IV - LAKE ONTARIO BASIN;
(1976) IJC INTERNATIONAL REFERENCE GROUP ON GREAT LAKES POLLUTION FROM LAND USE ACTIVITIES, 22LP;
LAND USE; WILDLIFE; HABITAT; VEGETATION; RECREATION; AGRICULTURAL POLLUTION; SOIL; URBAN RUNOFF; HYDROLOGY; GROUND WATER;
IJC-LU-VI; GCODE5;

177 GREAT LAKES BASIN COMMISSION;
LIMNOLOGY OF LAKES AND EMBAYMENTS;
(1972) GLBC FRAMEWORK STUDY APP 4 DRAFT NO 2 VOL 2;
GEOLOGY; PHYSIOGRAPHY; CLIMATOLOGY; PHYSICAL CHARACTERISTICS; HYDROLOGY; RIVERS; WAVES; WIND; CURRENTS; ICE; TEMPERATURE; THERMAL BAR; HARBORS; EMBAYMENTS; DISCHARGE FLOW; MATHEMATICAL MODELS; WATER LEVELS; METEOROLOGY; CHEMICAL LOADING; MEASUREMENT; WATER QUALITY; BACTERIA; MYCOPHYTA; PHYTOPLANKTON; SPECIES DIVERSITY; CLADOPHERA; FISH; SEDIMENTOLOGY;
GLBC-FS-4-D2-V2; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

178 GREAT LAKES BASIN COMMISSION;
OUTDOOR RECREATION;
(1975) GREAT LAKES BASIN FRAMEWORK STUDY APPENDIX 21, 243P;
RECREATION; DEVELOPMENT PLANNING;
GLBC-FS21; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

179 GREAT LAKES ENVIRONMENTAL CONFERENCE;
BACKGROUND PAPERS;
(1970) GREAT LAKES ENVIRONMENTAL CONFERENCE, PP6E;
WATER QUALITY; WATER; POLLUTION; AIR POLLUTION; POPULATION ESTIMATES; PHOSPHORUS; OIL   ; FISHERIES; DDT; PUBLIC HEALTH; REGULATION; MERCURY;
GEC-1; GCODE1; GCODE3; GCODE4; GCODE5; GCODE6;

180 GREAT LAKES FISHERY COMMISSION;
LIMNOLOGICAL SURVEY OF LAKE ONTARIO, 1964;
(1969) GREAT LAKES FISHERY COMMISSION. PP. 56.;
CHEMISTRY; PHYTOPLANKTON; BACILLARIOPHYCEAE; BENTHOS; FISHERIES; FISH;
GLF-TR14; GCODE5;
COLLECTION OF REPORTS ON LIMNOLOGICAL ASPECTS OF LAKE ONTARIO FROM 1964.;

181 GREAT LAKES FISHERY COMMISSION;
A MANAGEMENT POLICY FOR GREAT LAKES FISHERIES;
(1974) GREAT LAKES FISHERY COMMISSION. PP 2.;
MANAGEMENT; FISHERIES;
GLF-1; GCODE1; GCODE2; GCODE3, GCODE4; GCODE5; GCODE6;

182 GREAT LAKES FISHERY LABORATORY;
PROGRESS IN FISHERY RESEARCH 1976-77;
(1978) US DEPT OF INTERIOR FISH AND WILDLIFE SERVICE GREAT LAKES FISHERY LABORATORY, 105P;
RESEARCH; FISH; POPULATION DYNAMICS; BENTHOS; PHYSIOLOGY; PHYTOPLANKTON; ZOOPLANKTON; TOXICOLOGY;
US-IF-G1976-77; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

183 GREAT LAKES INSTITUTE;
ANNUAL REPORT 1964;
(1965) U OF TORONTO GREAT LAKES INSTITUTE REPORT PR16, 47P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1964; GCODE1; GCODE3; GCODE4; GCODE5;

184 GREAT LAKES INSTITUTE;
ANNUAL REPORT 1965;
(1966) U OF TORONTO GREAT LAKES INSTITUTE REPORT PR25, 55P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1965; GCODE1; GCODE3; GCODE4; GCODE5;

185 GREAT LAKES INSTITUTE;
ANNUAL REPORT 1967;
(1968) U OF TORONTO GREAT LAKES INSTITUTE REPORT PR31, 70P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1967; GCODE1; GCODE3; GCODE4; GCODE5;

186 GREAT LAKES INSTITUTE;
ANNUAL REPORT 1968;
(1969) U OF TORONTO GREAT LAKES INSTITUTE REPORT PR35, 42P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1968; GCODE1; GCODE3; GCODE4; GCODE5;

187 GREAT LAKES INSTITUTE,
ANNUAL REPORT 1969;
(1970) U OF TORONTO GREAT LAKES INSTITUTE REPORT PR40, 51P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1969; GCODE1; GCODE3; GCODE4; GCODE5;

188 GREAT LAKES INSTITUTE;
ANNUAL REPORT 1970;
(1971) U OF TORONTO GREAT LAKES INSTITUTE REPORT PR41, 29P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1970; GCODE1; GCODE3; GCODE4; GCODE5;

189 GREAT LAKES INSTITUTE;
ANNUAL REPORT 1971;
(1972) U OF TORONTO GREAT LAKES INSTITUTE REPORT EG-4, 25P;
RESEARCH; PROGRAMS;
CAN-UT-GLI-AR-1971; GCODE1; GCODE3; GCODE4; GCODE5;

190 GREAT LAKES LAB;
BENTHIC MACROINVERTEBRATE ANALYSIS;
(1977) GREAT LAKES LAB. WESTON STREAM SURVEY. 21PP;
ANNELIDA; ARTHROPODA; MOLLUSCA; NEMATODA; INSECTA;
NY-UBC-GLL-61; GCODE4G3T7; GCODE4G5T1; GCODE5A4T3S2; GCODE5A4T3S3;

191 GREAT LAKES LAB;
EFFECT OF GENESEE RIVER DISCHARGE AND WIND-INDUCED RESUSPENSION ON THE NEARSHORE AREA OF LAKE ONTARIO;
(1976) GREAT LAKES LAB. REPORT TO THE INTERNATIONAL REFERENCE GROUP ON GREAT LAKES POLLUTION FROM LAND USE ACTIVITIES OF THE INTERNATIONAL JOINT COMMISSION 77PP.;
DISCHARGE FLOW; WATER QUALITY; DISTRIBUTION; TRANSPORT; SEDIMENT; PLUMES;
NY-UBC-GLL-EPA7; GCODE5C2; GCODE5C215;

192 GREAT LAKES LAB;
INTERACTIONS OF TEMPERATURE AND LIGHT ON THE GROWTH AND REPRODUCTION OF CLADOPHORA GLOMERATA (L.) KUTZ.;
(1970) GREAT LAKES LAB. 29 PP.;
TEMPERATURE; LIGHT; GROWTH; CLADOPHORA;
NY-UBC-GLL-NPF1; GCODE5D3;

193 GREAT LAKES LAB;
AN INVESTIGATION OF THE NEARSHORE REGION OF LAKE ONTARIO IFYGL;
(1976) US EPA ECOLOGICAL RESEARCH SERIES EPA-600/3-76-115, 262P;
PHYTOPLANKTON; SEDIMENT; ZOOPLANKTON, NUTRIENTS;
US-EPA-600/3-76-115; GCODE5; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;
SUFFICIENT QUANTITATIVE AND QUALITATIVE INFORMATION CONCERNING WATER AND SEDIMENT CHEMISTRY, PHYTOPLANKTON, ZOOPLANKTON AND BENTHOS, IN ADDITION TO A LIMITED NUMBER OF PHYSICAL PARAMETERS BETWEEN APRIL 1972 AND MAY 1973 WAS COLLECTED TO ESTABLISH AN ENVIRONMENTAL BASELINE FOR THE WELLAND CANAL-ROCHESTER NEARSHORE ZONE. THIS INFORMATION COULD BE OF VALUE IN EVALUATING FUTURE ECOLOGICAL CHANGES IN THE AQUATIC REGION AS WELL AS IN THE CONSTRUCTION OF WATER INTAKES, BEACHES, POWER GENERATING PLANTS AND OTHER SHORELINE PROJECTS. THE STUDY AREA COULD GENERALLY BE CHARACTERIZED AS OLIGOTROPHIC TO MESOTROPHIC. THE LOWEST QUALITY CONDITIONS WERE OBSERVED AT THE GENESEE AND NIAGARA RIVER MOUTHS. THE THERMAL BAR FUNCTIONED AS A BARRIER WHICH KEPT THE MORE NUTRIENT ENRICHED WATER ON THE SHOREWARD SIDE OF THE BAR. CLADOPHORA GROWTH APPEARED TO BE LIMITED BY SUITABLE SUBSTRATE FOR ATTACHMENT AND THE EXTENT OF WAVE ACTION RATHER THAN CHEMICAL FACTORS. THE PHYSICAL NATURE OF THE SEDIMENT ALSO APPEARED TO BE OF MAJOR IMPORTANCE IN DETERMINING WHICH BENTHOS WERE FOUND IN WHICH REGIONS OF THE STUDY AREA;

194 GREAT LAKES LAB;
NIAGARA RIVER CADDISFLY STUDY;
(1976) GREAT LAKES LAB. FOR NEW YORK STATE LEGISLATURE. STATE CAPITOL. ALBANY, NY 6PP;
TRICHOPTERA; CONTROL; PESTICIDES; AQUATIC INVERTEBRATES;
NY-UBC-GLL-NYL-1; GCODE5A4T3;

195 GREAT LAKES LAB;
SURVEY OF PLANKTON AND BENTHIC MACROINVERTEBRATES IN HYDE PARK LAKE - GILL CREEK;
(1977) GREAT LAKES LAB. FOR CITY OF NIAGARA FALLS, N.Y. 4PP. ;
PHYTOPLANKTON; SEDIMENT; BENTHOS; HYDE PARK LAKE; ANNELIDA; ARTHROPODA; MOLLUSCA; NEMATODA;
NY-UBC-GLL-NF1; GCODE5A4T3S5;

196 GUNNING, GERALD E.;
FISHES, OUR CHANGING ENVIRONMENT AND THE CONTEMPORARY FISHERY SCIENTIST;
(1971) BIOSCIENCE. VOL. 21. NO. 22. PP.1115-1120;
FISH; FISHERIES; MANAGEMENT; COMMERCIAL FISHERIES;
2588; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

197 GUSTAFSON, PHILLIP F.;
THERMAL POLLUTION OF THE GREAT LAKES -A NON-PROBLEM;
( ) ARGONNE NATIONAL LABORATORY. PP. 7.;
THERMAL; POLLUTION; STRESS; ENERGY; ELECTRIC POWER GENERATING STATIONS;
5176; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

198 HAGMAN, BRENDA B.;
AN ANALYSIS OF GREAT LAKES ICE COVER FROM SATELLITE IMAGERY;
(1976) U.S. DEPT. OF COMMERCE. NOAA TECHNICAL MEMORANDUM ERL GLERL-9. PP. 11.;
ICE COVER; REMOTE SENSING; NAVIGATION SEASON EXTENSION; METHODS; ANALYSIS; ICE-SNOW PHYSICAL PROPERTIES;
US-CN-TM-ERL-GLERL-9; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

199 HAMBLIN, PAUL F.; ELDER, FLOYD C.;
A PRELIMINARY INVESTIGATION OF THE WIND STRESS FIELD OVER LAKE ONTARIO;
(1973) PROC 16TH CONF GREAT LAKES RES, P723-734;
WIND; CURRENTS;
IGP-C16-1973; CAN-CCIW-CR-6; GCODE5;
A PRELIMINARY ANALYSIS OF WIND STRESS DATA COLLECTED ON LAKE ONTARIO BY MEANS OF A NETWORK OF 11 METEOROLOGICAL BUOYS OPERATED BY CCIW DURING IFYGL EMPHASIZES THOSE FEATURES OF THE OVERLAKE STRESS FIELD OF SIGNIFICANCE TO THE DYNAMICS OF

THE LAKE CIRCULATION. DURING A SPRING AND EARLY SUMMER PERIOD, A NUMBER OF STORMS OCCURRED IN WHICH THE LAKE-AVERAGED STRESS ROSE TO APPROXIMATELY 1.6 DYNES/CM2 OVER A PERIOD OF SEVERAL DAYS. MAXIMUM VARIANCE OF LAKE-AVERAGED STRESS OCCURRED IN FREQUENCY BANDS CORRESPONDING TO A PERIOD OF 125 HR. STRESS VECTORS ROTATE PREPONDERANTLY IN THE ANTICYCLONIC SENSE, A FACTOR WHICH IS SHOWN TO HAVE AN INFLUENCE ON THE MAGNITUDE OF THE SURFACE CURRENTS. SPACIAL VARIATION OF THE WIND STRESS FIELD ON A SYNOPTIC SCALE IS QUANTIFIED IN TERMS OF THE LAKE-AVERAGED DIVERGENCE AND CURL OF THE WIND STRESS. MAXIMUM VALUES OF THE DIVERGENCE (2.5 X 10(EXP-7) CM/SEC2) AND OF THE CURL (3 X 10(EXP-7) CM/SEC2) ARE ASSOCIATED WITH THE PASSAGE OF STORMS. THE AMPLITUDES OF DIURNAL FLUCTUATIONS IN THE DIVERGENCE AND CURL ASSOCIATED WITH THE LAKE BREEZE ARE APPROXIMATE 2 X 10(EXP-8) CM/SEC2. DIVERGENCE PEAKS BETWEEN 1800 AND 1600 GMT;

200 HANKINSON, T. L.;
THE CREEK FISH OF WESTERN NEW YORK;
(1923) COPEIA 115:29-34;
FISH; SPECIES DIVERSITY; ABUNDANCE;
75E4; GCODE4G5T7; GCODE4G5T2; GCODE4G5T3S1; GCODE4G5T3S2; GCODE4G3T6;
GCODE4G3T4; GCODE4G5T3S3; GCODE5B2T1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5B2T2;

201 HARMAN, WILLARD N.;
REPLACEMENT OF PLEUROCERIDS BY BITHYNIA IN POLLUTED WATERS OF CENTRAL NEW YORK;
(1968) NAUTILUS. VOL. 81. NO. 3. PP77-83;
PLEUROCERIDAE; GONIOBASIS LIVESCENS; ABUNDANCE; DISTRIBUTION; GASTROPODA;
2012; GCODE5D3T4;

202 HARPER, DAVID B; DEAN, NEIL;
RECREATION RESOURCES;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 76P;
RECREATION; HISTORY; MAN; FACILITIES;
SEE-SITE; GCODE5D4; GCODE5D5; GCODE7;
THE UNIQUE COMBINATION OF NATURAL RESOURCES IN THE ST LAWRENCE-EASTERN ONTARIO SHORELINE REGION PROVIDES MANY ATTRACTIONS FOR RECREATIONISTS - INCLUDING WATER AREAS, ISLANDS, FISHERIES, AND VISUAL CONTRASTS OF TOPOGRAPHY, VEGETATION, AND ROCK AT THE SHORE ITSELF. SUPERIMPOSED CULTURAL FEATURES, SUCH AS THE INTERNATIONAL BORDER, SEAWAY SHIPPING, AND HISTORIC RESOURCES, ALSO ATTRACT VACATIONERS. PHYSICAL DEVELOPMENTS IN RESPONSE TO THE RECREATIONAL INFLUX THREATEN TO DAMAGE OR DESTROY MANY OF THE RESOURCES WHICH PROVIDE THE ORIGINAL ATTRACTIONS. EXISTING OUTDOOR RECREATION FACILITIES ARE LISTED AND CLASSIFIED AND DATA ON ACTIVITY TYPES AND CAPACITIES ARE GIVEN WHERE INFORMATION IS AVAILABLE. PUBLICLY-OWNED FACILITIES INCLUDE 22 STATE PARKS (SERVING OVER 1 MILLION VISITORS ANNUALLY), 22 LOCAL PARKS, 26 OTHER WATER-ORIENTED FACILITIES, AND 33 OTHER SITES. PRIVATELY-OWNED FACILITIES INCLUDE 67 WATER-ORIENTED SITES, 51 RESORT OR CABIN AREAS, 21 CAMPGROUNDS, AND 31 OTHER SITES. A CLASSIFICATION OF VISUAL FEATURES AS VIEWED FROM THE LAND AND FROM THE WATER IS DESCRIBED. OVER 20 TYPES OF FEATURES ARE GROUPED INTO 5 MAJOR CLASSES - NATURAL, AGRICULTURAL, SEASONAL RECREATION, DEVELOPED, AND TRANSITIONAL AREAS - AND THE SALIENT VISUAL APPEARANCE OF EACH IS DESCRIBED. RELATING TO INTENSITY OF DEVELOPMENT AS WELL AS TO VISUAL ASPECTS, THIS CLASSIFICATION HAS APPLICATION IN DETERMINING VISUAL IMPACTS OF FUTURE LAND USE CHANGES. SELECTED SCENIC SITES ARE IDENTIFIED. A COMPILATION OF NEARLY 200 HISTORIC BUILDINGS AND SITES FROM EXISTING INFORMATION IS ALSO INCLUDED, WITH DESCRIPTIONS OF HISTORIC SIGNIFICANCE, DATES, AND ASSOCIATED NOTABLE PERSONS. PROPOSALS FOR NEW ACQUISITION OR DEVELOPMENT OF RECREATIONAL RESOURCES IN THE REGION ARE SPARSE. BROAD STATEWIDE LAND USE AND RECREATION PLANS NEED FURTHER REFINEMENT BEFORE THEY CAN BE APPLIED SPECIFICALLY AS ACTION PROGRAMS TO THIS REGION. REGIONAL AND COUNTY RECREATION PLANNING PROGRAMS ARE AS YET IN THE EARLY STAGES OF INFORMATION GATHERING, NOT READY TO MAKE SPECIFIC PROPOSALS. SOME LOCAL PUBLIC RECREATION DEVELOPMENTS ARE UNDERWAY WITH STATE AND FEDERAL ASSISTANCE. MORE INTENSIVE SURVEYS AND EVALUATIONS OF RECREATION FACILITIES AND SCENIC AND HISTORIC RESOURCES ARE RECOMMENDED AS THE NEXT STEP IN SHORELINE RECREATION PLANNING. INTERIM IDENTIFICATION AND PROTECTION OF OUTSTANDING RECREATION RESOURCES IS ALSO URGED. INVESTIGATION OF THE ROLE OF RECREATION IN THE REGION'S FUTURE TO SATISFACTORILY MEET THE NEEDS

AND DESIRES OF BOTH RESIDENTS AND VISITORS. TO PROTECT NATURAL RESOURCE QUALITY, AND TO ENHANCE THE REGION'S UNIQUE FLAVOR IS RECOMMENDED AS A LONGER-RANGE UNDERTAKING;

203 HARTFORD, FRED; TANNER, WILLIAM F.;
CURRENT GREAT LAKES SHORE DAMAGE;
(1976) SHORE AND BEACH. VOL. 44. NO. 1. PP. 16-19;
EROSION; REGULATION; WATER LEVELS;
5186; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

204 HARTMAN, WILBER L.;
AVAILABILITY OF INFORMATION ON THE DISTRIBUTION OF SPORT AND COMMERCIAL FISHERIES;
( ) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P95-102;
FISH; COMMERCIAL FISHERIES; CREEL; DISTRIBUTION; CREEL CENSUS;
IJC-RA7; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

205 HEIDTKE, THOMAS M.;
MODELING THE GREAT LAKES SYSTEM: UPDATE OF EXISTING MODELS;
(1979) GLBC, 79P;
MODEL STUDIES; WATER QUALITY; CURRENTS; TRANSPORT; EFFLUENTS; DISPERSAL; BIBLIOGRAPHY;
GLBC-M1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

206 HEINKE, GERHARD W.;
HYDROLYSIS OF CONDENSED PHOSPHATES IN GREAT LAKES WATERS;
(1969) PROC. 12TH CONF. GREAT LAKES RESEARCH;
DETERGENTS; PHOSPHATES; WATER; ORTHOPHOSPHATES; SODIUM; PH; TEMPERATURE;
1722; GCODE5; GCODE6;
CONDENSED PHOSPHATES FROM DETERGENTS IN WASTEWATER ARE A MAJOR SUPPLY OF PHOSPHORUS TO SURFACE WATERS. THEY HYDROLYZE TO ORTHOPHOSPHATE, THE FORM MOST READILY AVAILABLE TO PLANTS AND ORGANISMS. THE CHEMICAL INDUSTRY HAS CARRIED OUT MANY STUDIES ON THE RATE OF HYDROLYSIS IN DISTILLED WATER. HOWEVER, FEW INVESTIGATIONS HAVE BEEN MADE IN NATURAL WATER AND WASTEWATER. THIS WORK CONCENTRATES ON RATE OF HYDROLYSIS STUDIES OF SODIUM TRIPOLYPHOSPHATE AND SODIUM PYROPHOSPHATE IN GREAT LAKES WATER UNDER CONDITIONS OF TEMPERATURE, PH, AND CONCENTRATION OCCURRING IN THE ENVIRONMENT. THE RESULTS OF LABORATORY WORK AND AN EXPERIMENT IN LAKE ONTARIO ARE PRESENTED. THE QUANTITATIVE EFFECTS OF CHANGES IN THESE PARAMETERS ON THE RATE ARE OUTLINED. COMPARISONS WITH RATES IN OTHER MEDIA ARE MADE;

207 HENDERSON, CROSWELL; JOHNSON, WENDELL L.; INGLIS, ANTHONY;
ORGANOCHLORINE INSECTICIDE RESIDUES IN FISH (NATIONAL PESTICIDE MONITORING PROGRAM);
(1969) PESTICIDE MONITORING JOURNAL. VOL. 3, NO. 3 PP. 145-171.;
CHLORINATED HYDROCARBON INSECTICIDES; FISH; DIELDRIN; CHLORDANE; MONITORING; PESTICIDES; DDE; DDT; DDD; METHODS;
5646; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
AS PART OF THE NATIONAL PESTICIDE MONITORING PROGRAM, FISH WERE COLLECTED FROM 50 SAMPLING STATIONS LOCATED IN THE GREAT LAKES AND IN MAJOR RIVER BASINS THROUGHOUT THE UNITED STATES. THREE COMPOSITE SAMPLES, CONSISTING OF 5 ADULT FISH OF EACH OF 3 SPECIES, WERE COLLECTED AT ALL STATIONS DURING THE SPRING AND FALL OF 1967 AND 1968. THE COMPOSITE WHOLE FISH SAMPLES WERE ANALYZED BY COMMERCIAL LABORATORIES FOR RESIDUES OF 11 ORGANOCHLORINE INSECTICIDES. DDT AND/OR METABOLITES WERE FOUND IN 584 OF THE 590 COMPOSITE SAMPLES, WITH VALUES RANGING TO 45 PPM (MG/KG WET WEIGHT, WHOLE FISH). DIELDRIN WAS FOUND IN 75% OF THE SAMPLES, WITH VALUES RANGING UPWARD TO NEARLY 2 PPM. OTHER ORGANOCHLORINE INSECTICIDES RESIDUES WERE FOUND IN FEWER SAMPLES, BUT SOME HAD FAIRLY HIGH RESIDUE LEVELS. RELATIVELY HIGH RESIDUES OF DDT AND METABOLITES, DIELDRIN, HEPTACHLOR, HEPTACHLOR EPOXIDE, AND CHLORDANE WERE FOUND CONSISTENTLY DURING ALL SAMPLING PERIODS AT SOME STATIONS.;

208 HENDRICKSON, JOHN F.;

A REVIEW OF THE ROLE OF THE INTERNATIONAL JOINT COMMISSION IN THE GREAT LAKES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP315-319;
IJC;
US-FCS-P1972; GCODE6;

209 HERBST, RICHARD F.;
ECOLOGICAL FACTORS AND THE DISTRIBUTION OF CLADOPHORA GLOMERATA IN THE GREAT LAKES;
(1969) AM MIDLAND NATURALIST 82:1 PP90-98;
ALGAE; CHLOROPHYTA; CLADOPHORA; DISTRIBUTION; PHOSPHORUS; TEMPERATURE; CURRENTS;
6669; GCODE1; GCODE2C2; GCODE3; GCODE4; GCODE5; GCODE6;
NUTRIENT ENRICHMENT IN THE GREAT LAKES HAS PROVIDED FERTILE AREAS FOR GROWTH OF ALGAL NUISANCES. ONE OF THESE SPECIES, CLADOPHORA GLOMERATA, HAS BECOME A MAJOR PROBLEM FOR MANY CITIES BORDERING THE GREAT LAKES. ECOLOGICAL FACTORS CONCERNING ITS GROWTH IN MILWAUKEE'S HARBOR WERE STUDIED, AND ITS DISTRIBUTION IN THE GREAT LAKES DETERMINED. PHOSPHORUS LEVELS APPEAR TO BE CLOSELY LINKED WITH CLADOPHORA INCREASES.;

210 HERDENDORF, CHARLES E.;
SHORELINE CHANGES OF LAKES ERIE AND ONTARIO;
(1975) BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES. V. 25, NO. 3. PP. 43-76.;
SHORELINE PROTECTION; EROSION; CURRENTS; WAVES; LITTORAL; SEICHES; HYPOLIMNION; TEMPERATURE; UPWELLING; SEDIMENT; TRANSPORT; SHORE PROCESSES;
BUF-BSNS-BULL-25(3); GCODE4; GCODE5;
TO UNDERSTAND THE MECHANICS OF SHORE RETREAT AND ADVANCE IT IS NECESSARY TO FIRST EXAMINE THE WATER MOVEMENTS IN THE LAKES. WAVES AND ALONGSHORE CURRENTS HAVE PRODUCED THE MAJOR CHANGES TO THE SHORELINES OF LAKES ERIE AND ONTARIO IN HISTORIC TIMES. IT IS THE INTENT OF THIS PAPER TO LOOK AT THE HYDRODYNAMIC PROCESSES IN THE NEARSHORE ZONE AS THEY IMPACT THE MATERIALS FORMING THE SHORES OF THESE LAKES. SPECIFIC REACHES OF THE COASTS WILL BE USED AS EXAMPLES OF WHERE EROSION, SEDIMENT TRANSPORT, AND ACCRETION PERSIST.;

211 HESTER, F. EUGENE;
THE ROLE OF THE BUREAU OF SPORT FISHERIES AND WILDLIFE IN THE GREAT LAKES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP39-43;
REGULATION, REGULATORY AGENCY; US; DEPT OF INTERIOR; FISH; WILDLIFE; RESEARCH;
US-FCS-P1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE MAJOR EMPHASIS OF THE BUREAU OF SPORT FISHERIES AND WILDLIFE MUST BE ON THE PROTECTION AND ENHANCEMENT OF THE GREAT LAKES HABITAT - PRIMARILY AS A SINGLE LARGE ECOSYSTEM. THE BUREAU HAS LONG BEEN CONCERNED IN THE GREAT LAKES REGION WITH SUCH DIVERSE ACTIVITIES AS ESTABLISHING REFUGES FOR MIGRATORY WATERFOWL, CONDUCTING FISHERY RESEARCH, EVALUATING THE EFFECTS OF FEDERALLY SPONSORED WATER RESOURCE DEVELOPMENT PROJECTS ON FISH AND WILDLIFE, REARING AND STOCKING OF GAME FISH, AND ASSISTING THE STATES IN FISH AND WILDLIFE MANAGEMENT BY GIVING TECHNICAL ADVICE AND FINANCIAL ASSISTANCE. THUS, THE BUREAU SHARES A STRONG COMMON INTEREST WITH OTHER FEDERAL ADMINISTRATIVE UNITS, AS WELL AS WITH STATE, INTERSTATE, AND INTERNATIONAL AGENCIES, IN PROTECTING, ENHANCING, AND ENSURING THE WISE USE OF FISH AND WILDLIFE IN THE GREAT LAKES BASIN.;

212 HETLING, LEO J.;
OCCURRENCE AND TRANSPORT OF NUTRIENTS AND HAZARDOUS POLLUTING SOLUTIONS IN THE GENESEE RIVER BASIN;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS ECOLOGICAL RESEARCH SERIES PP1-26;
NUTRIENTS; TRANSPORT; WATER QUALITY; NUTRIENT LOADING; IFYGL; ;
US-EPA-660/3-73-021; GCODE5C2T5;

213 HEUBUSCH, CAROL A.;
HOW THE GREAT GLACIERS CHANGED THE NIAGARA FRONTIER;
(1958) HOBBIES, 38(3)140P;
TOPOGRAPHY; GLACIAL SEDIMENTS; GLACIERS; GLACIATION;
7289; GCODE4G2; GCODE4G4; GCODE4G3; GCODE4G5; GCODE5A4; GCODE5B2; GCODE5B4;
GCODE5C2;

214 HILE, RALPH;
COLLECTION AND ANALYSIS OF COMMERCIAL FISHERY STATISTICS IN THE GREAT LAKES;
(1962) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 5. PP. 31.;
COMMERCIAL FISHERIES; FISHERIES; STATISTICS; ANALYSIS; FISHING EFFORT;
REGULATION; FISH;
GLF-TR5; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
CATCH-EFFORT STATISTICS ARE SUBMITTED ON CLOSELY SIMILAR MONTHLY REPORT FORMS BY LICENSED COMMERCIAL FISHERMEN THROUGHOUT U.S. AND CANADIAN WATERS OF THE GREAT LAKES. THIS FORM WAS TESTED EXPERIMENTALLY IN STATE OF MICHIGAN WATERS IN 1926; MONTHLY SUBMITTAL WAS REQUIRED OF MICHIGAN FISHERMEN BEGINNING SEPTEMBER 1927. USE OF THE FORM SPREAD GRADUALLY TO OTHER STATES AND ONTARIO; FULL COVERAGE WAS ACHIEVED IN 1950. THE PROCEDURE FOR TABULATION AND ANALYSIS OF THE STATISTICS ALSO IS THE SAME FOR ALL STATES AND ONTARIO. MUCH OF THE PRESENT REPORT IS CONCERNED WITH THE DEVELOPMENT OF THE ANALYTICAL PROCEDURE AND THE ILLUSTRATION, THROUGH EXAMPLE, OF ITS OPERATION. AN EARLY DISCOVERY WAS THE NEED FOR COMPLETELY INDEPENDENT TABULATIONS OF EFFORT FOR EACH OF THE PRINCIPAL SPECIES. TO MEET THIS NEED, EFFORT WAS CHARGED TO A SPECIES ONLY ON THOSE DAYS WHEN SOME POUNDAGE WAS PRODUCED. AT ABOUT THE SAME TIME IT WAS LEARNED THAT THE CATCH PER LIFT OF STATIONARY GEAR, WITHOUT ANY CONSIDERATION OF FISHING TIME (NIGHTS OUT) BEFORE LIFTING, GIVES SATISFACTORY ESTIMATES OF FLUCTUATIONS IN ABUNDANCE. LATER DEVELOPMENTS WERE CONCERNED MOSTLY WITH THE USE OF CATCH-EFFORT STATISTICS FOR DISSIMILAR GEARS TO OBTAIN SINGLE INDEX FIGURES FOR ABUNDANCE AND FISHING INTENSITY. THE PROCEDURE NOW EMPLOYED IS DESCRIBED AND ILLUSTRATED. SPECIAL CIRCUMSTANCES HAVE MADE NECESSARY CERTAIN EXCEPTIONS TO THE STANDARD PROCEDURE. EXCEPTIONS MADE TO DATE ARE LISTED AND THE REASONS FOR THEM EXPLAINED. EXPLANATIONS ARE GIVEN ALSO OF CERTAIN SPECIAL COMPUTATIONAL PROBLEMS, AND THE DISRUPTIVE EFFECTS OF CHANGES OF REGULATION ARE REVIEWED.;

215 HILE, RALPH,
U.S. FEDERAL RESEARCH ON FISHERIES AND LIMNOLOGY IN THE GREAT LAKES THROUGH 1964: AN ANNOTATED BIBLIOGRAPHY;
(1966) US DEPT OF INTERIOR FISH AND WILDLIFE SERVICE BUREAU OF COMMERCIAL FISHERIES SPECIAL SCIENTIFIC REPORT FISHERIES NO. 528,53P;
RESEARCH; BIBLIOGRAPHY; FISHERIES;
REF-B-US-IFC-SF528; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE ANNOTATED BIBLIOGRAPHY IS PRECEDED BY A BRIEF ACCOUNT OF THE FEDERAL RESEARCH PROGRAM IN FISHERIES AND LIMNOLOGY IN THE GREAT LAKES IN 1957-64. THE BIBLIOGRAPHY COVERS 324 PAPERS BY STAFF MEMBERS OF THE BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY IN ANN ARBOR, MICH., AND 35 BY ASSOCIATED SCIENTISTS WITH WHOM THE LABORATORY HAD CONTRACTUAL OR OTHER COOPERATIVE ARRANGEMENTS; INCLUDED ALSO ARE PATENTS ISSUED TO LABORATORY PERSONNEL. A ROSTER OF LABORATORY SCIENTISTS AS OF DECEMBER 31, 1964, IS APPENDED;

216 HILTUNEN, JARL K.;
THE BENTHIC MACROFAUNA OF LAKE ONTARIO;
(1969) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 14. PP 39-50.;
BENTHOS; OLIGOCHAETA; PONTOPOREIA AFFINIS; ABUNDANCE; AMPHIPODA;
GLF-TR14; GCODE5;
THE PRESENCE AND RELATIVE ABUNDANCE OF BOTTOM MACROFAUNA IN LAKE ONTARIO ARE DOCUMENTED. BOTTOM SAMPLES WERE COLLECTED AT 24 STATIONS IN SEPTEMBER 1964. THE QUANTITY OF ORGANISMS AND THE DISTRIBUTION OF SOME SPECIES WERE AFFECTED BY DEPTH OF WATER SAMPLES FROM THE SHALLOWER STATIONS (47.5 M OR LESS) YIELDED AN AVERAGE OF 42,031 ORGANISMS PER M SQUARED WHEREAS THE DEEPER STATIONS (92.5 M OR MORE) YIELDED AN AVERAGE OF ONLY 7,936. THE OLIGOCHAETA, THE MOST ABUNDANT GROUP OF MACROINVERTEBRATES, WAS REPRESENTED BY FOUR FAMILIES - ENCHYTRAEIDAE, LUMBRICULIDAE, NAIDIDAE, AND TUBIFICIDAE. THE LUMBRICULID WORM, STYLODRILUS HERINGIANUS, AND THE BURROWING AMPHIPOD, PONTOPOREIA AFFINIS, WERE RARE OR ABSENT IN AREAS AFFECTED BY POLLUTION. IN KINDS AND ABUNDANCE OF ORGANISMS, THE BOTTOM FAUNA IN LAKE ONTARIO WAS GENERALLY SIMILAR TO THAT IN LAKE MICHIGAN.;

217 HOLROYD, EDMOND W.;
LAKE EFFECT CLOUD BANDS AS SEEN FROM WEATHER SATELLITES;
(1973) J. ATMOSPHERIC SCIENCE, VOL. 26, P1165 IN NY SUNY ALBANY ATMOSPHERIC

SCIENCES RESEARCH CENTER, PUBLICATION #176 STUDIES OF GREAT LAKES SNOWSTORMS;
METEOROLOGY; CLOUD FORMATION; PHOTOGRAPHY; REMOTE SENSING SATELLITE ; SNOW; STORMS;
NY-LA-ASRC-M176; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
SATELLITE PHOTOGRAPHS OF THE TIROS AND ESSA SERIES WERE EXAMINED FOR THE PRESENCE AND DIMENSIONS OF LAKE-EFFECT CLOUDS OVER THE GREAT LAKES AND GULF OF ST. LAWRENCE. IT WAS FOUND THAT NEARLY ALL LAKE-EFFECT CLOUDS OCCURRED WHEN THE 850-MB TEMPERATURE WAS MORE THAN 13C COLDER THAN THE LAKE SURFACE TEMPERATURE. THE CLOUDS WERE ORGANIZED INTO PARALLEL BANDS RESEMBLING BUT HAVING LARGER DIMENSIONS THAN CLOUD STREETS. ENLARGED CLOUD BANDS WERE FOUND WHICH WERE 2.5 TIMES LARGER THAN NORMAL LAKE-EFFECT BANDS. THESE ENLARGED LAKE STORMS HAD PREFERRED ORIGINS AND APPEAR TO BE GENERATED BY FRICTIONAL DIFFERENCES BETWEEN LAND AND WATER, BY THE GEOMETRY OF THE BODY OF WARM WATER WITH RESPECT TO THE PREVAILING WIND, AND BY CERTAIN URBAN INFLUENCES;

218 HOPPER, B. E.;
PUNCTODORA EXOCHOPORA N. SP. (CHROMADORIDAE: NEMATODA) FROM THE CANADIAN SHORE OF LAKE ONTARIO;
(1963) CANADIAN J. ZOOLOGY, VOL. 41, PP1121-1126;
NEMATODA; PUNCTODORA; TAXONOMY;
2587; GCODE5;
PUNCTODORA EXOCHOPORA N. SP., COLLECTED FROM THE CANADIAN SHORE OF LAKE ONTARIO IN THE VICINITY OF BATH, ONTARIO, DIFFERS FROM THE TYPE P. RATZEBURGENSIS, IN HAVING THE EXCRETORY DUCT PROJECTING FROM THE BODY AND IN HAVING 15-16 PREANAL SUPPLEMENTS. ONLY ONE TO THREE ARE RECORDED FOR P. RATZEBURGENSIS. P. EXOCHOPORA DIFFERS FROM P. OHRIDENSIS BY ITS SHORTER RECTUM (30 VS. 50 U) AND HAVING SPICULES WITH BLUNT DISTAL ENDS. AN EMENDED GENERIC DIAGNOSIS IS GIVEN, DISTINGUISHING THE GENUS FROM PROCHROMADORA. NEOCHROMADORA TRILINEATA SCHNEIDER, 1943 IS REMOVED FROM SYNONYMY WITH P. OHRIDENSIS AND IS REGARDED AS INCERTAE SEDIS;

219 HORRALL, ROSS M.,
HISTORICAL FISHERIES INFORMATION -- ITS IMPORTANCE TO GREAT LAKES REHABILITATION PROGRAMS;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P115;
FISH; STOCKING;
IJC-M7; GCODE2; GCODE6;

220 HOUBRICK, RICHARD;
THE SMITHSONIAN ROLE IN GREAT LAKES RESEARCH;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP290;
US; SMITHSONIAN INSTITUTION; RESEARCH;
US-FCS-P1972; GCODE6;

221 HOUSE, MICHAEL R.;
GONIATITE ZONATION OF THE NEW YORK STATE DEVONIAN;
(1966) GEOLOGY OF WESTERN NEW YORK GUIDEBOOK, NY STATE GEOLOGICAL ASSOC 38TH ANNUAL MEETING, PP53-57;
GEOLOGY; NY;
NYG-38; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5D3; GCODE5D4; GCODE5D5;

222 HYDE, A. SIDNEY;
THE ECOLOGY AND ECONOMICS OF THE BIRDS ALONG THE NORTHERN BOUNDARY OF NEW YORK STATE;
(1939) ROOSEVELT WILDLIFE BULLETIN, 7:2, P66-215;
AVES; NY; WETLANDS; GAVIA; COLYMBIDAE; ARDEA; CASMERODIUS; BOTAURUS; ANAS; MERGUS; BUTEO; STURNUS VULGARIS; QUISCALUS QUISCULA; MOLOTHRUS ATER;
4936; GCODE5C5; GCODE5D3; GCODE5D5; GCODE5C4; GCODE7;

223 HYDROSCIENCE, INC;
ASSESSMENT OF THE EFFECTS OF NUTRIENT LOADINGS ON LAKE ONTARIO USING A MATHEMATICAL MODEL OF THE PHYTOPLANKTON;

(1976) IJC, 116P;
MATHEMATICAL MODELS; PHYTOPLANKTON; NUTRIENT LOADING; PHOSPHORUS LOADING;
IJC-EW-2; GCODE5;

224 IFYGL;
IFYGL BULLETIN;
(1977) IFYGL B NC 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 21;
PROGRAMS; IFYGL; RESEARCH; US; CANADA; DATA PROCESSING; HYDROLOGY; FACILITIES;
MEASUREMENT; INSTRUMENTS; TEMPERATURE; PHYTOPLANKTON; ZOOPLANKTON; TAXONOMY;
FISHERIES; DATA BASES; CURRENTS; MATHEMATICAL MODELS; BIBLIOGRAPHY;
IFY-B; GCODE5;

225 IJC;
FINAL REPORT OF THE INTERNATIONAL JOINT COMMISSION ON THE POLLUTION OF BOUNDARY
WATERS REFERENCE,

WATER; POLLUTION; NAVIGATION; WATER QUALITY; INDUSTRIAL SEWAGE TREATMENT;
DISEASES; LEGISLATION; REGULATION; WASTE TREATMENT; MUNICIPAL SEWAGE TREATMENT;
IJC-P1918; GCODE1C2; GCODE1F2; GCODE2B1T1; GCODE4A2T1; GCODE4A1T3; GCODE5A4T3;
GCODE6; GCODE7;

226 IJC;
NEW AND REVISED GREAT LAKES WATER QUALITY OBJECTIVES. VOL. 1;
(1977) IJC, 55P;
WATER QUALITY; REGULATION; REGULATORY AGENCY; PESTICIDES; HEAVY METALS;
IJC-WC-1-P77; GCODE6;

227 IJC;
POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST.
LAWRENCE RIVER VOLUME 1 - SUMMARY;
(1969) IJC, 151P;
WATER QUALITY; POLLUTION; EUTROPHICATION; CLADOPHORA; ALGAE; BACTERIA; NUTRIENT
LOADING; CHEMICAL LOADING;
IJC-P-1969-V.1; GCODE4; GCODE5; GCODE7;

228 IJC;
POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST.
LAWRENCE RIVER. VOLUME 3 - LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST.
LAWRENCE RIVER;
(1969) IJC, 329P;
PHYSICAL CHARACTERISTICS; LAND USE; POPULATION; HEAT BUDGET; TEMPERATURE;
CURRENTS; MORPHOLOGY; COASTAL ZONE; SEDIMENT; SEDIMENTATION; CHEMISTRY;
EUTROPHICATION; FISH; PHYTOPLANKTON; ZOOPLANKTON; BACTERIA; NUTRIENT LOADING;
CHEMICAL LOADING; RIVERS ; PHOSPHORUS REMOVAL; WATER QUALITY;
IJC-P-1969-V.3; GCODE5; GCODE5A4T3;

229 IJC;
A SPECIAL REPORT ON VARIOUS PROVISIONS OF THE GREAT LAKES WATER QUALITY
AGREEMENT;
(1977) IJC, P47;
WATER QUALITY; REGULATION;
IJC-WQ-SP; GCODE6;

230 IJC;
SUMMARY REPORT ON POLLUTION OF THE NIAGARA RIVER;
(1967) IJC LAKES ERIE - ONTARIO ADVISORY BOARD, 43P;
WATER QUALITY, POLLUTION; OIL; INDUSTRIAL SEWAGE TREATMENT; MUNICIPAL SEWAGE
TREATMENT; COLIFORMS; PHENOLS;
IJC-P; GCODE5A4T3;

231 IJC AMERICAN FALLS INTERNATIONAL BOARD;
PRESERVATION AND ENHANCEMENT OF THE AMERICAN FALLS AT NIAGARA;
(1974) IJC FINAL REPORT, PP76 + 44 PLATES;
NIAGARA FALLS; NY; PHYSICAL CHARACTERISTICS; GEOLOGIC FORMATION AND STRUCTURE;

PHYSIOGRAPHY; DIVERSIONS; VOLUME AND CURRENT FLOW; AESTHETICS; WATER LEVELS;
SAFETY;
IJC-NF-1974; GCODE5A4T3;

232 IJC AMERICAN FALLS INTERNATIONAL BOARD;
PRESERVATION AND ENHANCEMENT OF THE AMERICAN FALLS AT NIAGARA APPENDIX B -
AESTHETICS, PP46;
(1971) IJC INTERIM REPORT, PP46;
NIAGARA FALLS; NY; AESTHETICS; MODEL STUDIES; RECREATION;
IJC-NF-1B; GCODE5A4T3;

233 IJC AMERICAN FALLS INTERNATIONAL BOARD;
PRESERVATION AND ENHANCEMENT OF THE AMERICAN FALLS AT NIAGARA APPENDIX C -
GEOLOGY;
(1971) IJC INTERIM REPORT, PP71 + TABLES, FIGURES & PLATES;
NIAGARA FALLS; NY; STRATIGRAPHIC GEOLOGY; GEOLOGIC FORMATION AND STRUCTURE;
EROSION;
IJC-NF-1C; GCODE5A4T3;

234 IJC AMERICAN FALLS INTERNATIONAL BOARD;
PRESERVATION AND ENHANCEMENT OF THE AMERICAN FALLS AT NIAGARA APPENDIX D -
HYDRAULICS;
(1971) IJC INTERIM REPORT, PP87 + 16 PLATES;
NIAGARA FALLS; NY; DIVERSIONS; WATER SUPPLY; VOLUME AND CURRENT FLOW; ICE
CONDITIONS;
IJC-NF-1D; GCODE5A4T3;

235 IJC AMERICAN FALLS INTERNATIONAL BOARD;
PRESERVATION AND ENHANCEMENT OF THE AMERICAN FALLS AT NIAGARA APPENDIX E -
REMEDIAL MEASURES;
(1971) IJC INTERIM REPORT, PP54 + 9 TABLES + 14 PLATES;
NIAGARA FALLS; NY; VOLUME AND CURRENT FLOW; WATER LEVELS; PHYSICAL
CHARACTERISTICS; GEOLOGIC FORMATION AND STRUCTURE; SAFETY; EROSION; SHORELINE
PROTECTION; COST-BENEFIT ANALYSIS;
IJC-NF-1E; GCODE5A4T3;

236 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY ANNUAL REPORT;
(1972) IJC, PP315;
WATER QUALITY; ANNUAL REPORT; WATER; POLLUTION; EUTROPHICATION; LAND USE;
NAVIGATION; MONITORING; CHEMICAL LOADING; MEASUREMENT; RESEARCH;
IJC-WQ-AR-1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

237 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY ANNUAL REPORT OF THE WATER QUALITY OBJECTIVES
SUBCOMMITTEE AND THE TASK FORCE ON THE SCIENTIFIC BASIS FOR WATER QUALITY
CRITERIA;
(1976) IJC, PP63;
REGULATION; WATER QUALITY; ANNUAL REPORT; CHEMICAL COMPOSITION; CHLORINE;
DISSOLVED OXYGEN; SILVER; MIREX; FISH; HEAVY METALS; ORGANOTIN COMPOUNDS;
TOXICITY; PHOSPHORUS; PNA;
IJC-WQ-AR-1976AA; GCODE4; GCODE5; GCODE7;
THIS REPORT OUTLINES RECOMMENDED NEW AND REVISED WATER QUALITY OBJECTIVES WITH
SUPPORTING RATIONALE; PRESENTS RATIONALE FOR SUBSTANCES FOR WHICH OBJECTIVES
WERE RESEARCHED BUT FOR WHICH ADEQUATE SCIENTIFIC BACKGROUND DATA TO DERIVE
OBJECTIVES WERE NOT AVAILABLE; OBJECTIVES UNDER ACTIVE REVIEW; AND INTENDED
FUTURE ACTIVITIES. RESEARCH NEEDS REQUIRED TO AID IN THE REVISION AND DERIVATION
OF CERTAIN OBJECTIVES ARE ALSO OUTLINED.;

238 IJC GREAT LAKES WATER QUALITY BOARD;
GREAT LAKES WATER QUALITY BOARD REPORT APPENDIX A, B, AND C;
(   ) IJC, 88P;
MUNICIPAL SEWAGE TREATMENT; NUTRIENT LOADING; PHOSPHORUS LOADING;
IJC-WQ-R-A; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

239 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FIFTH ANNUAL REPORT;
(1976) IJC, PP72;
WATER QUALITY; ANNUAL REPORT; MONITORING; CONTROL; WATER; POLLUTION;
IJC-WQ-AR-1976; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

240 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FIFTH ANNUAL REPORT APPENDIX B ANNUAL REPORT OF THE SURVEILLANCE SUBCOMMITTEE;
(1976) IJC, PP134;
WATER QUALITY; MONITORING; ANNUAL REPORT; COASTAL ZONE; FISH; WILDLIFE; CLADOPHORA; OIL POLLUTION; PHOSPHORUS LOADING; REGULATION; REGULATORY AGENCY;
IJC-WQ-AR-1976B; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THIS APPENDIX CONTAINS 1976 INFORMATION AND DATA PERTAINING TO THE WATER QUALITY OF THE GREAT LAKES AND CONNECTING CHANNELS. THIS VOLUME ALSO INCLUDES A SUMMARY OF PLANNED 1977 GREAT LAKES SURVEILLANCE ACTIVITIES ALONG WITH STRATEGY COMPRISING THE 9 YR (1976-86) GREAT LAKES INTERNATIONAL SURVEILLANCE PLAN.;

241 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FIFTH ANNUAL REPORT APPENDIX C ANNUAL REPORT OF THE REMEDIAL PROGRAMS SUBCOMMITTEE;
(1976) IJC, PP66 + 3 APP; IJC, PP65 + 3 APP;
WATER QUALITY; ANNUAL REPORT; REGULATION; CONTROL; AIR POLLUTION; CHEMICAL LOADING; PHOSPHORUS LOADING;
IJC-WQ-AR-1976C; GCODE6;
THIS APPENDIX CONTAINS INFORMATION ON THE STATUS AND PROGRESS OF US AND CANADIAN EFFORTS IN ADDRESSING THE GOALS OF THE AGREEMENT.;

242 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FIFTH ANNUAL REPORT APPENDIX D ANNUAL REPORT OF THE RADIOACTIVITY SUBCOMMITTEE;
(1976) IJC, PP44;
RADIOACTIVITY; WATER QUALITY; ANNUAL REPORT; MONITORING; NUCLEAR POWER GENERATION; MEASUREMENT; EFFLUENTS;
IJC-WQ-AR-1976D; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

243 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FOURTH ANNUAL REPORT;
(1975) IJC, PP162;
WATER QUALITY; ANNUAL REPORT; ANALYSIS; CONTROL; WASTE TREATMENT; PHOSPHORUS LOADING; PHOSPHORUS REMOVAL; PCB; RADIOACTIVITY; LAND USE; DREDGING; ;
IJC-WQ-AR-1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

244 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FOURTH ANNUAL REPORT APPENDIX A ANNUAL REPORT OF THE WATER QUALITY OBJECTIVES SUBCOMMITTEE;
(1975) IJC, PP123 + APP;
WATER QUALITY; ANNUAL REPORT; CHEMICAL COMPOSITION; HEAVY METALS; PHYSICAL CHARACTERISTICS; FLUORIDES; TEMPERATURE;
IJC-WQ-AR-1976A; GCODE6;
THIS REPORT CONTAINS PROPOSALS FOR THE REVISION OF EXISTING, AND FOR NEW WATER QUALITY OBJECTIVES AND SUPPORTS THESE PROPOSALS WITH THE LATEST INFORMATION AND DATA AVAILABLE.;

245 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FOURTH ANNUAL REPORT APPENDIX B ANNUAL REPORT OF THE SURVEILLANCE SUBCOMMITTEE;
(1975) IJC, PP255 + APP 1;
WATER QUALITY; ANNUAL REPORT; MONITORING; PHOSPHORUS LOADING; EUTROPHICATION;
IJC-WQ-AR-1975B; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;
THIS APPENDIX CONTAINS AN ASSESSMENT OF THE GREAT LAKES AND CONNECTING CHANNELS PROBLEM AREAS WHICH DO NOT MEET WATER QUALITY OBJECTIVES AND/OR JURISDICTIONAL STANDARDS. A DISCUSSION OF SELECTED PROBLEM AREAS HIGHLIGHTS MAJOR PROBLEM AREAS

WHICH HAVE EXPERIENCED A CHANGE IN WATER QUALITY, AND PROBLEMS OF GENERAL CONCERN TO THE OVERALL CHARACTERISTICS OF GREAT LAKES WATER QUALITY. THIS YEAR'S REPORT DESCRIBES THE EXISTING CONDITIONS AND RECENT TRENDS IN THE WATER QUALITY OF THE NIAGARA RIVER, LAKE ONTARIO AND THE ST. LAWRENCE RIVER. THE SUBCOMMITTEE MATHEMATICALLY MODELLED PHYTOPLANKTON GROWTH TO EVALUATE THE EFFECT OF PRESENT AND PROTRACTED NUTRIENT LOADS ON LAKE ONTARIO.;

246 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY FOURTH ANNUAL REPORT APPENDIX D ANNUAL REPORT OF THE RADIOACTIVITY SUBCOMMITTEE;
(1975) IJC, PP40;
WATER QUALITY; ANNUAL REPORT; RADIOACTIVITY; NUCLEAR POWER GENERATION; NUCLEAR POWER GENERATING STATIONS; MONITORING; DISCHARGE FLOW;
IJC-WQ-AR-1975D; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THIS APPENDIX CONTAINS DETAILED INFORMATION AND DATA AVAILABLE AS OF MAY 1976 REGARDING RADIOACTIVITY IN THE GREAT LAKES BASIN.;

247 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY SECOND ANNUAL REPORT;
(1973) IJC, PP315;
WATER QUALITY; ANNUAL REPORT; MONITORING; CONTROL; METHODS; REGULATION; PHOSPHORUS; PHOSPHORUS LOADING; ANALYSIS;
IJC-WQ-AR-1973; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

248 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY SIXTH ANNUAL REPORT;
(1977) IJC, PP89;
WATER QUALITY; ANNUAL REPORT; CONTROL; REGULATION;
IJC-WQ-AR-1977; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

249 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY SIXTH ANNUAL REPORT APPENDIX B ANNUAL REPORT OF THE SURVEILLANCE SUBCOMMITTEE;
(1977) IJC, PP116;
WATER QUALITY; ANNUAL REPORT; MONITORING; PUBLIC PARTICIPATION; PHOSPHORUS LOADING;
IJC-WQ-AR-1977B; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THIS APPENDIX REVIEWS THE INFORMATION COLLECTED DURING THE YR 1977 PERTAINING TO THE WATER QUALITY OF THE GREAT LAKES. THE APPENDIX ALSO INCLUDES THE RESULTS OF A SURVEY DESIGNED TO DETERMINE PUBLIC PERCEPTIONS OF THE WATER QUALITY OF THE GREAT LAKES, AND AN OUTLINE OF THE LAKE ERIE SURVEILLANCE PLAN DEVELOPED DURING THE PAST YEAR WHICH PROVIDES THE DETAILS FOR PLANNING AND COORDINATING THE SURVEILLANCE ACTIVITIES OF BOTH COUNTRIES.;

250 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY SIXTH ANNUAL REPORT APPENDIX C ANNUAL REPORT OF THE REMEDIAL PROGRAMS SUBCOMMITTEE;
(1977) IJC, PP59 + APPS;
ANNUAL REPORT; WATER QUALITY; REGULATION; WASTE TREATMENT;
IJC-WQ-AR-1977C; GCODE6;

251 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY SIXTH ANNUAL REPORT APPENDIX D ANNUAL REPORT OF THE RADIOACTIVITY SUBCOMMITTEE;
(1977) IJC, PP65;
RADIOACTIVITY; LEGISLATION; MONITORING; NUCLEAR POWER GENERATION; NUCLEAR POWER GENERATING STATIONS; DISCHARGE FLOW; MINE WASTES; CONTROL; REGULATION; WATER QUALITY; ANNUAL REPORT; AIR POLLUTION; RADIOACTIVE WASTES;
IJC-WQ-AR-1977D; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

252 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY THIRD ANNUAL REPORT;
(1974) IJC, PP170;
WATER QUALITY; ANNUAL REPORT; ANALYSIS; EUTROPHICATION; CONTROL; INDUSTRIAL

SEWAGE TREATMENT; MUNICIPAL SEWAGE TREATMENT; WASTE TREATMENT; RESEARCH;
REGULATION; PHOSPHORUS LOADING;
IJC-WQ-AR-1974; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

253 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY THIRD ANNUAL REPORT APPENDIX A ANNUAL REPORT OF THE
WATER QUALITY OBJECTIVES SUBCOMMITTEE;
(1974) IJC, PP234;
WATER QUALITY; ANNUAL REPORT; PHYSICAL CHARACTERISTICS; MICROBIOLOGY; CHEMICAL
COMPOSITION; ANALYSIS; WATER; MEASUREMENT;
IJC-WQ-AR-1944A; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THIS APPENDIX CONTAINS THE DETAILED INFORMATION AND DATA WITH RESPECT TO THE
WATER QUALITY OBJECTIVES FOR THE BOARD'S 3RD ANNUAL REPORT TO THE IJC;

254 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY THIRD ANNUAL REPORT APPENDIX B ANNUAL REPORT OF THE
SURVEILLANCE SUBCOMMITTEE;
(1974) IJC, PP212;
WATER QUALITY; ANNUAL REPORT; CHEMICAL LOADING; CHLORIDE; MONITORING;
IJC-WQ-AR-1974B; GCODE1; GCODE2; GCODE3B1T1; GCODE4A1T3; GCODE4A2T1;
GCODE5A4T3; THIS REPORT CONTAINS THE DETAILED INFORMATION AND DATA WITH RESPECT
TO WATER QUALITY IN THE GREAT LAKES AND CONNECTING CHANNELS AS WELL AS THE
DETAILED SURVEILLANCE PROGRAM DEVELOPED BY THE SUBCOMMITTEE FOR THE BOARD'S 3RD
ANNUAL REPORT TO THE IJC.;

255 IJC GREAT LAKES WATER QUALITY BD;
GREAT LAKES WATER QUALITY THIRD ANNUAL REPORT APPENDIX C ANNUAL REPORT OF THE
REMEDIAL PROGRAMS SUBCOMMITTEE;
(1974) IJC, PP194;
WATER QUALITY; ANNUAL REPORT; CONTROL; PHOSPHORUS REMOVAL; INDUSTRIAL SEWAGE
TREATMENT; COST-BENEFIT ANALYSIS;
IJC-WQ-AR-1974C; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THIS APPENDIX CONTAINS THE DETAILED INFORMATION AND DATA WITH RESPECT TO
MUNICIPAL, INDUSTRIAL, AND OTHER PROGRAMS BEING IMPLEMENTED TO ACHIEVE THE WATER
QUALITY OBJECTIVES FOR THE GREAT LAKES AND SUMMARIZED IN THE BOARD'S 3RD ANNUAL
REPORT TO THE IJC.;

256 IJC GREAT LAKES WATER QUALITY BD;
INTERNATIONAL GREAT LAKES WATER QUALITY BOARD SEMI-ANNUAL REPORT;
(1973) IJC, PP13;
WATER QUALITY; ANNUAL REPORT; ANALYSIS; PHENOLS; RESEARCH;
IJC-EW-AR-1973B; GCODE6;

257 GREAT LAKES WATER QUALITY BOARD;
NEW AND REVISED SPECIFIC WATER QUALITY OBJECTIVES PROPOSED FOR THE 1972
AGREEMENT BETWEEN THE UNITED STATES & CANADA ON GREAT LAKES WATER QUALITY BY THE
GREAT LAKES WATER QUALITY BOARD. SECTIONS 1-6;
(1976) IJC, 31P;
WATER QUALITY; REGULATION; PESTICIDES; HEAVY METALS; TEMPERATURE; ASBESTOS;
IJC-WQ-1-P1; GCODE6;

258 IJC GREAT LAKES WATER QUALITY BOARD
GREAT LAKES WATER QUALITY. STATUS REPORT ON THE PERSISTENT TOXIC POLLUTANTS IN
THE LAKE ONTARIO BASIN BY THE IMPLEMENTATION COMMITTEE;
(1976) IJC, 95P;
FISH; POLLUTION; SLUDGE; RUNOFF DRAINAGE; SEDIMENT; WATER QUALITY; BENTHOS;
ZOOPLANKTON; PHYTOPLANKTON; PCB; HEAVY METALS; WILDLIFE; AIR
POLLUTION;
IJC-WQ-TP-6; GCODE5;

259 IJC INTERNATIONAL GREAT LAKES LEVELS BOARD;
REGULATION OF GREAT LAKES WATER LEVELS APPENDIX A HYDROLOGY AND HYDRAULICS;
(1976) IJC, PP59;
WATER LEVELS; LAKE LEVELS; REGULATION; HYDROLOGY; METEOROLOGY; CLIMATIC FACTORS;

PHYSIOGRAPHY; PHYSICAL CHARACTERISTICS; HYDRAULIC CYCLES; PRECIPITATION; EVAPORATION; WATER SUPPLY; ICE COVER; FORECASTING;
IJC-GL-3A; GCODE1; GCODE2; GCODE3B1T1; GCODE4; GCODE4A2T1; GCODE5A4T3; GCODE5; GCODE6; GCODE7;

260 IJC INTERNATIONAL GREAT LAKES LEVELS BOARD;
REGULATION OF GREAT LAKES WATER LEVELS APPENDIX C SHORE PROPERTY;
(1973) IJC, PP166 + ANNEX;
WATER LEVELS; LAKE LEVELS; REGULATION; PROPERTIES; EROSION; FLOODS; US; SHORE; SHORELINE PROTECTION; METHODS; STRUCTURES; ; SEWERS; ECONOMICS; COST-BENEFIT ANALYSIS;
GCODE1A; GCODE1B; GCODE1C1; GCODE1D2; GCODE1D3; GCODE1D4; GCODE1F3; GCODE1F2; GCODE1F4; GCODE1F5; GCODE1M1; GCODE1M2; GCODE1M4; GCODE1K2; GCODE1K4; GCODE1M2; GCODE1M4; GCODE2A; GCODE2B; GCODE2C1; GCODE2C2; GCODE2D1; GCODE2D2; GCODE2D3; GCODE2D6; GCODE2H3; GCODE2H4; GCODE2H5; GCODE2G; GCODE2F2; GCODE2F3; GCODE2F4; GCODE2F5; GCODE2E; GCODE2J; GCODE3A2; GCODE3A4; GCODE3A5; GCODE3B3; GCODE3B6; GCODE3C; GCODE3E2; GCODE3F1; GCODE3F2; GCODE3F4; GCODE4B1; GCODE4B2; GCODE4B3; GCODE4D; GCODE4F1; GCODE4F2; GCODE4E4; GCODE4G2; GCODE4G3; GCODE4G4; GCODE4G5; GCODE5A2; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D4; GCODE5D5; GCODE6;

261 IJC INTERNATIONAL GREAT LAKES LEVELS BOARD;
REGULATION OF GREAT LAKES WATER LEVELS APPENDIX D FISH, WILDLIFE AND RECREATION;
(1973) IJC, PP171+ APPENDICES;
WATER LEVELS; REGULATION; CONTROL; FISHERIES; FISH; WILDLIFE; RECREATION; COST-BENEFIT ANALYSIS; WETLANDS; POLLUTION; SHORELINE PROTECTION; EROSION; BEACHES; COMMERCIAL FISHERIES;
IJC-GL-3D; GCODE1; GCODE2; GCODE3; GCODE4A1T3; GCODE4A2T1; GCODE5A4T3; GCODE7;
THIS APPENDIX PRESENTS THE RESULTS OF STUDIES OF THE FISHERIES, WILDLIFE AND RECREATION INTERESTS UNDERTAKEN BY THE INTERNATIONAL GREAT LAKES LEVELS BOARD, WHICH WAS ESTABLISHED BY THE INTERNATIONAL JOINT COMMISSION.;

262 IJC INTERNATIONAL GREAT LAKES LEVELS BOARD;
REGULATION OF GREAT LAKES WATER LEVELS APPENDIX F POWER;
(1973) IJC, PP122;
WATER LEVELS; LAKE LEVELS; REGULATION; ELECTRIC POWER GENERATION; ELECTRIC POWER GENERATING STATIONS; US; CANADA;
GCODE1; GCODE2; GCODE3; GCODE3E1T1; GCODE4; GCODE5; GCODE5A4T3; GCODE6; GCODE7;

263 IJC INTERNATIONAL NIAGARA BD OF CONTROL;
REPORT ON THE OPERATION OF THE LAKE ERIE-NIAGARA RIVER ICE BOOM DURING THE 1970-1971 WINTER SEASON;
(1971) IJC, PP16 + 16 ENCLOSURES;
ICE CONDITIONS; ICE CONTROL; ICE COVER; NAVIGATION; ANNUAL REPORT;
IJC-NBC-1971; GCODE4G3; GCODE4G5; GCODE5A4T3;

264 IJC INTERNATIONAL NIAGARA BD OF CONTROL;
REPORT ON THE OPERATION OF THE LAKE ERIE-NIAGARA RIVER ICE BOOM DURING THE 1971 - 1972 WINTER SEASON;
(1972) IJC 3RD ANNUAL REPORT, PP14 + 12 ENCLOSURES;
ICE CONDITIONS; ICE CONTROL; ICE COVER; NAVIGATION; ANNUAL REPORT;
IJC-NBC-1972; GCODE4G3; GCODE4G5; GCODE5A4T3;

265 IJC INTERNATIONAL NIAGARA BD OF CONTROL;
REPORT ON THE OPERATION OF THE LAKE ERIE-NIAGARA RIVER ICE BOOM 1972-1973 WINTER SEASON;
(1973) IJC, PP12 + 5 ENCLOSURES;
ICE CONDITIONS; ICE CONTROL; ICE COVER; NAVIGATION; ANNUAL REPORT;
IJC-NBC-1973; GCODE4G3; GCODE4G5; GCODE5A4T3;

266 IJC INTERNATIONAL NIAGARA BD OF CONTROL;
REPORT ON THE OPERATION OF THE LAKE ERIE-NIAGARA RIVER ICE BOOM 1974-1975 WINTER SEASON;
(1975) IJC, PP19 + 6 ENCLOSURES;

ANNUAL REPORT; ICE CONDITIONS, ICE COVER; ICE CONTROL; NAVIGATION;
IJC-NBC-1975; GCODE4G3; GCODE4C5; GCODE5A4T3;

287 IJC INTERNATIONAL NIAGARA WORKING COMMITTEE;
A REPORT ON AN EVALUATION OF THE 1974-75 DATA COLLECTION PROGRAM IN CONNECTION WITH THE LAKE ERIE - NIAGARA RIVER ICE BOOM STUDY,
(1975) IJC INTERNATIONAL NIAGARA BOARD OF CONTROL, PP53 + APP;
ICE COVER; ICE CONTROL; ICE CONDITIONS; EVALUATION; METEOROLOGY; MATHEMATICAL MODELS; ICE SNOW BUILDUP AND DECAY;
IJC-NBC-R1975; GCODE465; GCODE5A413;

288 IJC INTERNATIONAL REFERENCE GROUP ON UPPER LAKES POLLUTION;
FOURTH SEMI-ANNUAL REPORT TO THE GREAT LAKES WATER QUALITY BOARD FROM THE UPPER LAKES REFERENCE GROUP;
(1974) IJC, 30P;
REGULATION; RESEARCH; NOMENCLATURE;
IJC-RG-AR-1974-4; GCODE6;

289 IJC INTERNATIONAL REFERENCE GROUP ON UPPER LAKES POLLUTION;
SEMI-ANNUAL REPORT TO THE GREAT LAKES WATER QUALITY BOARD;
(1973) IJC, 29P;
RESEARCH; REGULATORY AGENCY; FISH; PHTHALATES;
IJC-RG-AR-1973-2; GCODE2; GCODE6;

270 IJC INTERNATIONAL REFERENCE GROUP ON UPPER LAKES POLLUTION;
THIRD SEMI-ANNUAL REPORT TO THE GREAT LAKES WATER QUALITY BOARD;
(1974) IJC, 13P;
RESEARCH; WATER QUALITY; FISH; COASTAL ZONE;
IJC-RG-AR-1974-3; GCODE6;

271 IJC PLUARG;
DETAILED STUDY PLAN;
(1974) IJC, PP814;
WATER; POLLUTION; WATER QUALITY; LAND USE; PROGRAMS; IJC;
GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; IJC-CDS-1;

272 IJC PLUARG;
ENVIRONMENTAL MANAGEMENT STRATEGY FOR THE GREAT LAKES SYSTEM;
(1978) IJC, PP115;
MANAGEMENT; LAND USE; POLLUTION; WATER; WATER QUALITY; PHOSPHORUS; CHEMICAL LOADING; PESTICIDES; PCB; CONTROL; COST-BENEFIT ANALYSIS;
IJC-L-PLUARG-F; GCODE6;

273 IJC PLUARG;
MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES;
(1974) IJC VOLUME 1, PP509;
LAND USE; WATER QUALITY; MANAGEMENT; PROGRAMS; DOMESTIC SEWAGE; TRANSPORTATION; CONTROL; POLLUTION; MINE WASTES; AGRICULTURAL POLLUTION; EROSION;
IJC-LW-VOL. 1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

274 IJC PLUARG

MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES VOL 2;
(1974) US EPA SECTIONS 10-17, VARIOUS PAGINGS;
MANAGEMENT; PROGRAMS; WATER QUALITY; WILDERNESS AREAS; RECREATION; WASTE TREATMENT; DREDGING; DEEP-WELL DISPOSAL;
IJC-LW-VOL.2; GCODE1; GCODE3; GCODE2; GCODE4; GCODE5; GCODE6;
PART 10: FORESTRY, PART 11: RECREATIONAL LAND, PART 12: UNDEVELOPED LAND, PART 13: LIQUID WASTE DISPOSAL, PART 14: SOLID WASTE DISPOSAL, PART 15: DREDGING ACTIVITIES, PART 16: DEEP-WELL DISPOSAL, PART 17: MANAGEMENT AND CONTROL OF LAND USE USE/WATER QUALITY PROBLEMS;

275 IJC PLUARG;
1976 RIVER EFFECTS SURVEY COORDINATION MEETING;
(1975) IJC, PP30;
RIVERS; SEDIMENTATION; NUTRIENTS; NUTRIENT LOADING;
IJC-L-PLUARG-D1976M; GCODE4B1110; GCODE6;

276 IJC PLUARG;
SUMMARY REVIEW OF POLLUTION FROM LAND USE ACTIVITIES;
(1975) IJC, PP66;
LAND USE; WATER QUALITY; WATER POLLUTION; NUTRIENTS; PESTICIDES; SEDIMENTATION;
CHEMICAL LOADING; NUTRIENT LOADING; TRANSPORTATION; MINE WASTES; URBAN RUNOFF;
AGRICULTURAL POLLUTION; EROSION; RECREATION; WILDERNESS AREAS; WASTE TREATMENT;

IJC-LRP; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

277 IJC PLUARG
EARLY ACTION PROGRAM REPORT
(1974) EARLY ACTION PROGRAM REPORT; IJC, 22P;
LAND USE; WATER QUALITY; RUNOFF DRAINAGE; REGULATION; AGRICULTURAL POLLUTION;
PESTICIDES; ROAD SALT; SEDIMENT;
IJC-RG-E; GCODE6;

278 JACKSON, DANIEL F.; NEMEROW, NELSON L.; RAND, MYRTON C.;
ECOLOGICAL INVESTIGATIONS OF THE OSWEGO RIVER DRAINAGE BASIN I. THE OUTLET;
(1964) U OF MI GREAT LAKES RES DIVISION PROC 7TH CONF GREAT LAKES RES, P86-99;
PHOSPHATES; KJELDAHL NITROGEN; ABS; PH; TEMPERATURE; VOLUME AND CURRENT FLOW;
COLIFORMS; PHYTOPLANKTON; ZOOPLANKTON; ROTIFERA; ALGAE; PERIPHYTON; NUTRIENT
LOADING;
IGR-C7-1964; GCODE5D3T4;
THE OSWEGO RIVER DRAINAGE, 5,121 SQ MI, IS THE LARGEST DRAINAGE AREA OF THE EASTERN PART OF LAKE ONTARIO. IN ORDER TO ASCERTAIN ITS EFFECT ON THE LAKE A SERIES OF SAMPLING STATIONS HAS BEEN ESTABLISHED AT 10 DIFFERENT SITES ALONG CONTRIBUTING STREAMS. THIS REPORT REPRESENTS THE RESULTS OBTAINED AT STATION 1, THE OUTLET OF THE OSWEGO RIVER INTO LAKE ONTARIO, FROM JANUARY 10 THROUGH MARCH 6, 1964. WEEKLY AVERAGE VALUES FOR PHOSPHATES WERE 3.31 MG/L, TOTAL KJELDAHL NITROGEN, 2.06 MG/L, BSS, 0.16 MG/L. THE AVERAGE WEEKLY PH VALUE WAS 7.2 WHILE THE WATER TEMPERATURE AVERAGED 3 C, WITH A FLOW OF 7,257 CFS. THE AVERAGE COLIFORM COUNT WAS 14,176 PER 100 ML, THE AVERAGE WEEKLY TOTAL PHYTOPLANKTON VALUE WAS 1,190 ORGANISMS PER ML, WHILE THE ZOOPLANKTON POPULATION, WHICH CONSISTED ALMOST ENTIRELY OF ROTIFERS, AVERAGED 4.4 PER LITER. THE PERIPHYTON COMMUNITY CONSISTED OF 55 SPECIES REPRESENTING 28 GENERA. THE WEEKLY AVERAGE NUMBER OF ALGAL SPECIES GROWING ON BRICKS IN THE RIVER WAS 25. THESE HAD A VOLATILE WEIGHT OF 4.2 MG/L AND CONSISTED OF 913/CM2. THE POLLUTION LOAD OF THE OSWEGO RIVER WAS EVALUATED FROM INFORMATION OBTAINED THROUGH THIS STUDY;

279 JIUSTO, JAMES E.;
CRYSTAL DEVELOPMENT AND GLACIATION OF A SUPERCOOLED CLOUD;
(1971) J. RECHERCHES ATMOSPHERE. V.5, PP69-85;
ICE; SNOW; ICE-SNOW PHYSICAL PROPERTIES; MATHEMATICAL MODELS; GROWTH;
GLACIATION; CLOUD FORMATION;
GCODE6; NY-LA-ASRC-P170;
AN UNSOPHISTICATED NUMERICAL MODEL WAS DEVELOPED TO ESTIMATE THE GROWTH OF ICE CRYSTALS AND THE GLACIATION RATE OF SUPERCOOLED CLOUDS AS A FUNCTION OF UPDRAFT SPEED AND ICE NUCLEUS CONCENTRATION. THE CONDITIONS CHOSEN BEST REPRESENT GREAT LAKES SNOWSTORMS. THE DATA INDICATE THAT UNDER TYPICAL CIRCUMSTANCES (UPDRAFTS < OR =3M/SEC) RIMING BECOMES THE DOMINANT CRYSTAL GROWTH MECHANISM AFTER ONLY A FEW MINUTES TIME, AND WITH ICE NUCLEUS CONCENTRATIONS LESS THAN A FEW TENS PER LITER, GRAUPEL WILL SUBSEQUENTLY FORM. WITH NUCLEUS CONCENTRATIONS IN EXCESS OF 50-100LSUB -1, THE SUPERCOOLED CLOUDS RAPIDLY GLACIATE (<15 MINUTES TIME) BEFORE SUBSTANTIAL RIMING CAN TAKE PLACE. WHILE ONE MIGHT THEN EXPECT INDIVIDUAL CRYSTALS THAT GROW STRICTLY BY DIFFUSION OF WATER VAPOR, THE HIGH CRYSTAL CONCENTRATIONS LEAD TO PRONOUNCED SNOWFLAKE AGGREGATION. THE COMMON OCCURRENCE OF SNOWFLAKE AGGREGATES IN MOST WINTER SNOWSTORMS SUGGEST CRYSTAL CONCENTRATIONS WELL IN EXCESS OF THAT INDICATED BY COLD-BOX NUCLEUS

MEASUREMENTS, AND PROBABLY PREFERRED CLOUD REGIONS OF HIGH CRYSTAL CONGREGATION. CERTAIN CLOUD SEEDING IMPLICATIONS READILY FOLLOW;

280 JIUSTO, JAMES E.; KAPLAN, MICHAEL L.;
SNOWFALL FROM LAKE-EFFECT STORMS;
(1972) MONTHLY WEATHER REVIEW. V.100,N.1,PP62-66;
STORMS; LAKES; SNOW; PRECIPITATION;
NY-UA-ASRC-P170; GCODE4; GCODE5; GCODE6;
THREE YR OF WINTER LAKE-STORM DATA WERE ANALYZED TO DETERMINE SNOWFALL DISTRIBUTION PATTERNS DOWNWIND OF LAKE ERIE AND LAKE ONTARIO. THE TOTAL AMOUNT OF SNOWFALL AND THE AREA OF GROUND COVER IN EACH OF 23 LAKE-EFFECT STORMS WERE DETERMINED FOR BOTH LAKES. TOTAL SNOWFALL MASS WAS HIGHLY DEPENDENT ON TIME OF YEAR; NOVEMBER AND EARLY DECEMBER STORMS WERE TWO TO FIVE TIMES MORE PRODUCTIVE THAN JANUARY STORMS. A CONSIDERABLE VARIATION IN SNOW DENSITY (SNOWFALL DEPTH TO MELT WATER RATIO) COULD BE ATTRIBUTED MAINLY TO DIFFERENCES IN SNOW CRYSTAL TYPE;

281 JOHNSON, B. G. HERBERT
SOME STATISTICS OF THE POPULATIONS OF PARASITIC PHASE SEA LAMPREYS IN CANADIAN WATERS OF THE GREAT LAKES;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP45-52;
ABUNDANCE; PETROMYZON MARINUS; GROWTH; SEX RATIO; SIZE;
1613; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
PARASITIC-PHASE SEA LAMPREYS, TAKEN IN COMMERCIAL FISHING GEAR, WERE COLLECTED FROM GREAT LAKES FISHERMEN WITH RECORDS OF THE PLACE, DATE AND MANNER OF CAPTURE. THE CATCH OF SEA LAMPREYS PER UNIT OF EFFORT WAS LOWER IN THE NORTH CHANNEL THAN IN LAKE HURON PROPER OR GEORGIAN BAY, BOTH IN 1967 AND IN 1968, AN EARLY INDICATION OF THE SUCCESS OF SEA LAMPREY CONTROL MEASURES RECENTLY UNDERTAKEN IN THE NORTH CHANNEL. THE PROPORTION OF MALE TO FEMALE SEA LAMPREYS TAKEN IN THE COMMERCIAL FISHERY DECLINED MARKEDLY IN THE FALL IN ALL AREAS SAMPLED. SEGREGATION OF THE SEXES COULD BIAS THOSE ESTIMATES OF SEA LAMPREY ABUNDANCE THAT ARE BASED ON EVIDENCE OF THEIR NUMBERS IN THE COMMERCIAL FISHERY. RATE OF GROWTH IN LENGTH IS NEARLY LINEAR DURING THE FISHING SEASON, BUT A CONSISTENT SIZE DIFFERENCE EXISTS BETWEEN SEA LAMPREYS ATTACHED TO CERTAIN DIFFERENT HOST FISHES;

282 JOHNSON, MURRAY G.; COMEAU, JOHN C.; HEIDTKE, THOMAS M.; SONZOGNI, WILLIAM C.; STAHLBAUM, BARRY W.;
MANAGEMENT INFORMATION BASE AND OVERVIEW MODELLING;
(1978) IJC PLUARG, PP90;
MODEL STUDIES; WASTE TREATMENT; PHOSPHORUS LOADING; SUSPENDED SOLIDS; MANAGEMENT; CONTROL; PHOSPHORUS;
IJC-L-PLUARG-1; GCODE3; GCODE4; GCODE5; GCODE6;

283 JUDD, JOHN H.; SWEENEY, ROBERT A.;
THE DISTRIBUTION AND ROLE OF AQUATIC MACROPHYTES AND CLADOPHORA IN THE GREAT LAKES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P135-146;
DISTRIBUTION; CLADOPHORA; ECONOMICS;
IJC-RA7; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

284 KAISER, KLAUS L. E.;
THE RISE AND FALL OF MIREX;
(1978) ENV SCIENCE & TECHNOLOGY 12(5):520-528;
MIREX; TOXICITY; BIOACCUMULATION; FISH; AVES; INSECTA; EGGS; KEPONE; LEGISLATION; FOOD WEBS; US PATENT; PESTICIDES; INSECTICIDES; CHLORINATED HYDROCARBON PESTICIDES; CHLORINATED HYDROCARBON INSECTICIDES; HISTORY;
7472; GCODE5A4T3; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5D3; GCODE5D4; GCODE4D5; GCODE5C3; GCODE5C4; GCODE5C5;

285 KANAYAMA, RICHARD K.;
THE USE OF ALKALINITY AND CONDUCTIVITY MEASUREMENTS TO ESTIMATE CONCENTRATIONS OF 3-TRIFLUOROMETHYL-4-NITROPHENOL REQUIRED FOR TREATING LAMPREY STREAMS;

(1963) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 7. PP. 16.;
FISH; TOXICITY; TFM; LAMPRICIDES; PETROMYZON MARINUS; MEASUREMENT; CONDUCTIVITY;
ALKALINITY;
GLF-1N7; GCODE1; GCODE2; GCODE6;
A METHOD HAS BEEN DEVISED TO ESTIMATE THE MAXIMUM CONCENTRATION OF TFM THAT WILL
KILL SEA LAMPREYS AND THE MAXIMUM THAT WILL NOT KILL FISH. IT IS BASED ON THE
RELATION OF THESE CONCENTRATIONS TO THE ALKALINITY AND CONDUCTIVITY OF VARIOUS
WATERS. PRETREATMENT BIOASSAYS WILL CONTINUE TO BE REQUIRED FOR PRECISE
DETERMINATION OF TREATMENT CONCENTRATIONS, BUT THE ESTIMATES MADE POSSIBLE BY
THE METHOD WILL PERMIT A GREAT REDUCTION IN THE NUMBER OF BIOASSAYS ON A SINGLE
STREAM.;

286 KEAST, ALLEN;
FEEDING OF SOME GREAT LAKES FISHES AT LOW TEMPERATURES;
(1968) J. FISHERIES RESEARCH BOARD OF CANADA. VOL. 25. NO.6. PP1199-1218;
FISH; FOOD ACQUISITION; TEMPERATURE; FUNDULUS; ICTALURUS; POMOXIS
NIGROMACULATUS; LEPOMIS; AMBLOPLITES RUPESTRIS; PERCA FLAVESCENS; AMIA CALVA;
ESOCIDAE; ESOX AMERICANUS; ESOX; NOTEMIGONUS CRYSOLEUCAS; NOTROPIS; PIMEPHALES
PROMELAS; SEMOTILUS; CATOSTOMUS; GASTEROSTEUS ; SERRANIDAE;
CENTRARCHIDAE; MICROPTERUS DOLOMIEUI; PERCIDAE;
CLADOCERA; OSTRACODA; COPEPODA; AMPHIPODA; ISOPODA; EPHEMEROPTERA;
PLECOPTERA; CHIRONOMIDAE; DIPTERA; LARVAE; LEPIDOPTERA; HEMIPTERA; COLEOPTERA;
GASTROPODA; LAMELLIBRANCHIATA; ANNELIDA; HYDRACARINA; EGGS;
143F; GCODE5D1; GCODE5D4T5;
FIELD STUDIES ON LOW TEMPERATURE FEEDING IN FRESHWATER FISHES WERE CARRIED OUT
AS FOLLOWS: (1) FISH LAKE, NEAR PICTON, ONTARIO, JANUARY-MARCH 1966 AND 1967,
1200 FISH NETTED FROM UNDER THE ICE AT A TEMPERATURE OF 4C; (2) LITTLE CATARAQUI
CREEK NEAR COLLINS BAY, APRIL 1966, GROUPS OF FISH (TOTAL, 544 INDIVIDUALS)
NETTED AT INTERVALS OF SEVERAL DAYS AS THE WATER TEMPERATURE ROSE FROM 6.6 TO
11C; (3) UPPER JONES CREEK, NEAR MALLORYTOWN, TWO EXTENSIVE COLLECTIONS (TOTAL,
1005 INDIVIDUALS) MADE BETWEEN APRIL 27 AND 30, 1966 (AT A WATER TEMPERATURE OF
8C), AND MAY 15 AND 17 (15C). THE FOLLOWING FINDINGS RESULTED. SOME MEMBERS OF
ALL SIX SPECIES IN FISH LAKE CONTAINED FOOD BUT THE PERCENTAGE VARIED FROM 50%
IN UMBRA LIMI DOWN TO 10% IN FUNDULUS DIAPHANUS. HENCE FEEDING WAS ERRATIC.
WITHIN SPECIES THE SMALLER INDIVIDUALS INVARIABLY CONTAINED MORE FOOD THAN
LARGER FISH. THE SAME WAS TRUE OF SMALLER AS COMPARED WITH LARGER, BODIED
SPECIES. AFTER THE THAW IN LITTLE CATARAQUI CREEK ACTIVE FEEDING COMMENCED AT
DIFFERENT TEMPERATURES IN THE VARIOUS SPECIES: IT WAS ALREADY UNDERWAY AT 6.5C
IN ICTALURUS NEBULOSUS AND POMOXIS NIGROMACULATUS, BUT DID NOT START IN LEPOMIS
GIBBOSUS AND AMBLOPLITES RUPESTRIS UNTIL THE WATER TEMPERATURE REACHED 8.5C.
PRIOR TO THIS THE STOMACHS OF SPECIES WERE SHRUNKEN, MUCOUS-FILLED, AND DRAWN
FAR FORWARD IN THE BODY CAVITY. FEW PERCA FLAVESCENS, ACTIVE WINTER FEEDERS FED
IN APRIL, IMMEDIATELY PRIOR TO SPAWNING. IN MOST OF THE JONES CREEK FISHES THERE
WAS A MARKED INCREASE IN WEIGHT OF ALIMENTARY CONTENTS BETWEEN 8 AND 15C. TO THE
DIFFERENCES IN WEIGHTS OF ALIMENTARY CONTENTS AT 6 AND 15C MUST BE ADDED
ACCELERATED DIGESTION RATES AT 15C. IN ALL THE WATERWAYS STUDIED THE FISH
CONSUMED A MUCH SMALLER RANGE OF PREY ITEMS AT LOW TEMPERATURES THAN AT HIGHER
ONES. THIS APPLIED IN MIDWINTER, COMPARED WITH SUMMER, IN JONES CREEK. A FEW
FOODS WERE ESPECIALLY PROMINENT IN THE DIET AT LOW TEMPERATURES, AND SPECIES
FOOD SPECIALIZATIONS WERE SUPPRESSED.;

287 KELLERAN, ANN;
OLD FORT NIAGARA;
(1960) BUFFALO HISTORICAL SOCIETY ADVENTURES IN WESTERN NY HISTORY 1(1);
FORT NIAGARA; NY; HISTORY; MAN;
BUTLER; GCODE5A4T3;

288 KELLICOTT, D. S.;
NOTES ON MICROSCOPIC LIFE IN THE BUFFALO WATER SUPPLY;
(1878) AM J MICROSCOPY AND POP SCI, 3,P250-252;
WATER SUPPLY; STEPHANODISCUS, MELOSIRA; BACILLARIOPHYCEAE; RHIZOSOLENIA;
AMPHIPRORA; SURIRELLA; ASTERIONELLA; FRAGILARIA; CYCLOTELLA; CYMATOPLEURA;
CYCLOPS; BOSMINA; DINOBRYON; CERATIUM; GOMPHONEMA; MERIDION; SYNEDRA; COCCONEIS;
HYDRA; VORTICELLA; ROTIFERA; DIFFLUGIA; DESMIDS; CLOSTERIUM; STAURASTRUM;

PEDIASTRUM;
6495; GCODE4G5; GCODE5A4T3;

289 KEMP, ANTHONY L. W.;
ORGANIC MATTER IN THE SEDIMENTS OF LAKES ONTARIO AND ERIE;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP237-249;
SEDIMENT; ORGANIC MATTER; CARBON; NITROGEN; BITUMENS; HUMIC ACIDS; FULVIC ACIDS; LAKES;
1772; GCODE4; GCODE5;
ORGANIC CARBON AND CARBONATE CARBON WERE DETERMINED IN SIX PISTON CORES FROM LAKE ONTARIO AND FOUR PISTON CORES FROM LAKE ERIE. THE CHANGES IN ORGANIC CARBON WITH DEPTH OF BURIAL ARE RELATED TO SEDIMENT TYPE AND EH, NITROGEN, BITUMENS, HUMIC ACIDS, FULVIC ACIDS AND KEROGEN WERE MEASURED IN THREE SURFACE SEDIMENT SAMPLES FROM EACH LAKE. THE BASIN SEDIMENTS OF LAKE ONTARIO CONSISTED OF BLACK LAMINATED GREY SILTY CLAY MUDS OVERLYING GREY GLACIAL CLAY, WITH MUD THICKNESSES RANGING FROM 4.6 TO 13.6 M IN THE CORES. ORGANIC CARBON CONTENT DECREASED 50% IN THE TOP 20 CM OF SEDIMENT AND THEN GRADUALLY DECREASED TO 1% AT THE GLACIAL CLAY CONTACT. A COMPLEX ORGANIC CARBON HORIZON WAS FOUND TWO THIRDS OF THE WAY DOWN THE POST GLACIAL MUD COLUMN AT EACH CORE STATION AND WAS ATTRIBUTED TO A WARMER CLIMATE BETWEEN 4000 AND 7500 YEARS BP. LAKE ERIE MAIN BASIN SEDIMENTS CONSISTED OF A UNIFORM GREY SILTY CLAY MUD WITH A SIMILAR DECREASE IN ORGANIC SEDIMENTS CONSISTED OF A UNIFORM GREY SILT6 CLAY MUD WITH A SIMILAR DECREASE IN ORGANIC CARBON AS IN LAKE ONTARIO. PENETRATION WAS LESS THAN TWO THIRDS OF THE POST GLACIAL MUD COLUMN EXCEPT IN THE SANDUSKY BASIN, WHERE A HIGHER ORGANIC CARBON VALUE OBTAINED AT THE BOTTOM OF THE CORE SUGGESTED AN ORGANIC HORIZON IN LAKE ERIE SIMILAR TO THAT FOUND IN LAKE ONTARIO. A CORE FROM THE WESTERN BASIN WAS TYPICAL OF A SMALL LAKE CORE WITH A HIGH ORGANIC CARBON CONTENT AND PLANT DETRITUS IN THE POST GLACIAL MUD. EH REMAINED AT ABOUT ZERO VOLTS IN THE POST GLACIAL MUDS OF BOTH LAKES AND INCREASED TO ABOUT 0.150 VOLT IN THE GLACIAL CLAY. CARBONATES GENERALLY SHOWED AN INVERSE RELATIONSHIP TO THE ORGANIC CARBON, INCREASING TO ABOUT 2% CARBONATE CARBON IN THE POST GLACIAL MUDS. BITUMENS ACCOUNTED FOR 3 TO 6% OF THE ORGANIC MATTER, HUMIC AND FULVIC ACIDS FOR 19 TO 27% AND KEROGEN FOR 35 TO 49% IN THE SURFACE CENTIMETER OF SEDIMENT, IN THE MAIN BASINS OF THE TWO LAKES. THE LOWER ORGANIC CARBON CONTENT AND THE GREATER PERCENT KEROGEN IN THE LAKE ERIE SURFACE SEDIMENT WERE, IN PART, ATTRIBUTED TO GREATER DECOMPOSITION OF THE ORGANIC MATTER BY BOTTOM DWELLING ORGANISMS;

290 KEMP, ANTHONY L. W.;
SEDIMENTATION IN THE LOWER GREAT LAKES;
(1973) IJC PROC OF A WORKSHOP ON WATER QUALITY AND LAND USE ACTIVITIES, PP202-223;
SEDIMENTATION; SEDIMENT; NUTRIENTS; MERCURY; MEASUREMENT; CHEMICAL COMPOSITION; CARBON; NITROGEN; PHOSPHORUS;
IJC-RG3; GCODE3; GCODE4, GCODE5; GCODE6;
SEDIMENTATION RATES AND CHANGES IN ORGANIC CARBON, NITROGEN, PHOSPHORUS AND MERCURY CONCENTRATIONS HAVE BEEN DETERMINED AT 14 CORE LOCATIONS, REPRESENTING BASINS OF FINE-GRAINED SEDIMENT IN LAKES ONTARIO, ERIE AND HURON. SEDIMENTATION RATES ARE ESTIMATED BY AVERAGING THE WEIGHT OF SEDIMENT DEPOSITED ABOVE THE CASTANEA (CHESTNUT) POLLEN DECLINE DATED AT 1930 FOR LAKE ERIE, AND ABOVE THE AMBROSIA (RAGWEED) POLLEN RISE, DATED AT 1850. THERE IS A 3-FOLD INCREASE IN SEDIMENTATION RATE IN LAKE ERIE AND THE KINGSTON BASIN OF LAKE ONTARIO SINCE EUROPEAN SETTLEMENT OF THE LAKE DRAINAGE BASINS. THE NUTRIENT AND HG CONCENTRATION ARE ENRICHED AT THE SEDIMENT SURFACE IN ALL THE CORES FROM LAKES ONTARIO AND ERIE, WHILE THE HURON CORES SHOW LITTLE CHANGE AT THE SURFACE FROM THEIR BACKGROUND CONCENTRATIONS. THE ENRICHMENT. ARE ATTRIBUTED TO INCREASED NUTRIENT AND HG LOADING TO THE ONTARIO AND ERIE SEDIMENTS, WITH THE MAJOR INCREASES AFTER ABOUT 1950. THE PRESENT-DAY LOADING OF NUTRIENTS AND HG TO THE SEDIMENTS PARALLELS THE RATES OF SEDIMENTATION AT EACH LOCATION, BEING GREATEST IN LAKE ERIE. EARLY-COLONIAL LOADING OF NUTRIENTS AND HG TO LAKES ONTARIO AND ERIE ARE GENERALLY SIMILAR TO THE MODERN LOADING OF LAKE HURON.;

291 KEMP, ANTHONY L. W.; ANDERSON, THANE W.; THOMAS, RICHARD L.; MUDROCH, ALENA;
SEDIMENTATION RATES AND RECENT SEDIMENT HISTORY OF LAKES ONTARIO, ERIE AND HURON;

(1974) JOURNAL OF SEDIMENTARY PETROLOGY, VOL. 44, NO. 1, PP. 207-218;
SEDIMENT; SEDIMENTATION; CARBON; NITROGEN; PHOSPHORUS; MERCURY; POLLEN; ANALYSIS NUTRIENT
LOADING; DISSOLVED SOLIDS; PH; PARTICLE SIZE;
GCODE3; GCODE4; GCODE5; 5240;
SEDIMENTATION RATES AND CHANGES IN ORGANIC CARBON, NITROGEN, PHOSPHORUS AND MERCURY CONCENTRATIONS WERE DETERMINED FOR 14 CORE LOCATIONS, REPRESENTING BASINS OF FINE-GRAINED SEDIMENT IN LAKES ONTARIO, ERIE AND HURON. SEDIMENTATION RATES WERE ESTIMATED BY AVERAGING THE WEIGHT OF SEDIMENT DEPOSITED ABOVE THE CASTANEA (CHESTNUT) POLLEN DECLINE DATED AT 1930 FOR LAKE ONTARIO AND 1935 FOR LAKE ERIE, AND ABOVE THE AMBROSIA (RAGWEED) POLLEN RISE, DATED AT 1850. PRESENT DAY SEDIMENTATION RATES WERE HIGH IN LAKE ERIE, RANGING FROM 647 TO 5,649 G/M2YR, LOW TO INTERMEDIATE IN LAKE ONTARIO, RANGING FROM 300 TO 1,156 G/M2YR AND LOW IN LAKE HURON RANGING FROM 147 TO 325 G/M2YR. THERE HAS BEEN A THREEFOLD INCREASE IN SEDIMENTATION RATE IN LAKE ERIE SINCE 1935 AND THE KINGSTON BASIN OF LAKE ONTARIO SINCE 1930. THE NUTRIENT AND HG CONCENTRATIONS ARE ENRICHED AT THE SEDIMENT SURFACE IN ALL THE CORES FROM LAKES ERIE AND ONTARIO, WHILE THE HURON CORES SHOW LITTLE CHANGE AT THE SURFACE FROM THEIR BACKGROUND CONCENTRATIONS. THE ENRICHMENTS ARE ATTRIBUTED TO INCREASED NUTRIENT AND HG LOADING TO THE ONTARIO AND ERIE SEDIMENTS, WITH THE MAJOR INCREASES AFTER ABOUT 1950. THE PRESENT-DAY LOADING OF NUTRIENTS AND HG TO THE SEDIMENTS PARALLELS THE RATES OF SEDIMENTATION AT EACH LOCATION, BEING GREATEST IN LAKE ERIE. EARLY-COLONIAL LOADING OF NUTRIENTS AND HG TO LAKES ONTARIO AND ERIE ARE GENERALLY SIMILAR TO THE MODERN LOADING OF LAKE HURON. THE TOTAL LOADING OF SEDIMENT, NUTRIENTS AND HG WAS ESTIMATED FOR EACH LAKE. PRESENT-DAY SEDIMENT ACCUMULATION OF 4,800X10EXP3, 23,400X10EXP3, AND 3,500X10EXP3 METRIC TONS WAS ESTIMATED FOR LAKES ONTARIO, ERIE AND HURON RESPECTIVELY.;

292 KEMP, ANTHONY L. W.; HARPER, NANCY S.;
SEDIMENTATION RATES AND A SEDIMENT BUDGET FOR LAKE ONTARIO;
(1976) J GREAT LAKES RES 2(2):324-340;
SEDIMENTATION; LITTORAL DRIFT; MEASUREMENT;
GCODE5A4; GCODE5C2; GCODE5A473; GCODE5C275; GCODE5D374; GCODE5A1; GCODE5D;
GCODE5B4; GCODE5C5; GCODE5B211;
PRESENT-DAY SEDIMENTATION RATES OF FINE-GRAINED SEDIMENT WERE DETERMINED AT 39 OFFSHORE LOCATIONS IN LAKE ONTARIO. THE SEDIMENTATION RATES WERE CALCULATED BY AVERAGING THE WEIGHT OF SEDIMENT DEPOSITED ABOVE THE AMBROSIA (RAGWEED) POLLEN HORIZON, DATED AT 1850. THE RATES ARE VARIABLE, RANGING FROM A LOW OF 85 G/SQUARE M/YR (0.3 MM/YR) TO A MAXIMUM OF 1225 G/SQUARE M/YR (2.2 MM/YR). RATES ARE HIGHEST AT THE EASTERN AND WESTERN EXTREMES OF THE MAIN BASIN OF THE LAKE AND APPEAR TO BE RELATED TO LITTORAL DRIFT PATTERNS. MEAN SEDIMENTATION RATES OF 435, 200, 510, AND 530 G SQUARE M/YR ARE CALCULATED FOR THE NIAGARA, MISSISSAUGA, ROCHESTER AND KINGSTON BASINS RESPECTIVELY. A TOTAL OF 4.8 MILLION TONS OF FINE-GRAINED SEDIMENT IS ANNUALLY DEPOSITED IN THE LAKE. RIVER INPUTS ARE THE MAJOR SOURCE OF THE GRAIN SEDIMENTS WITH THE NIAGARA RIVER ACCOUNTING FOR 50% OF ALL INCOMING MATERIALSM MOST OF THE SUSPENDED MATERIALS ARE DEPOSITED IN THE ROCHESTER AND KINGSTON BASINS (38%) OR ARE CARRIED OUT OF THE LAKE VIA THE ST. LAWRENCE RIVER (30%). THIS REFLECTS THE GENERAL EASTWARD MOVEMENT OF THE MATERIALS AND THEIR DEPOSITION EITHER TOWARDS THE OUTLET OR THEIR MOVEMENT OUT OF THE LAKE.;

293 KEMP, ANTHONY L. W.; MUDROCHOVA, ALENA;
NITROGEN IN SEDIMENTED ORGANIC MATTER FROM LAKE ONTARIO;
(1972) PROC INT MEET HUMIC SUBSTANCES, NIEUWERSLUIS, P137-157;
SEDIMENT; TOTAL NITROGEN; FULVIC ACIDS; HUMIC ACIDS; AMINO ACIDS;
CAN-CCIW-CP-7; GCODE5;
INSOLUBLE, COMBINED AMINO ACIDS ACCOUNT FOR 45% OF THE TOTAL NITROGEN IN THE WHOLE SEDIMENT OF LAKE ONTARIO. COMBINED AMINO SUGARS (10%), FIXED AMMONIUM NITROGEN (6%) AND EXCHANGEABLE AMMONIUM NITROGEN (2%) MAKE UP THE REST OF THE KNOWN NITROGEN COMPOUNDS, LEAVING ABOUT 36% OF THE NITROGEN WHICH CAN NOT BE ACCOUNTED FOR BY CHEMICALLY DEFINED, RECOGNIZABLE FORMS. THE SEDIMENT CONTAINS 3 TIMES MORE FULVIC ACIDS THAN HUMIC ACIDS, BOTH OF WHICH ARE BY DEFINITION EXTRACTABLE IN DILUTE SODIUM HYDROXIDE. THE DISTRIBUTION OF INDIVIDUAL PROTEIN AND NON-PROTEIN AMINO ACID RESIDUES IN THE HUMIC AND FULVIC ACIDS ON A RELATIVE

BASIS IS SIMILAR TO THE ONE FOUND IN THE WHOLE SEDIMENT, IN FRESH WATER ALGAE, ZOOPLANKTON AND BACTERIA. FURTHERMORE, THE RELATIVE ABUNDANCE OF AMINO ACID RESIDUES FOUND IN THE SEDIMENTS ARE CLOSE TO THE ONES REPORTED FOR SEVERAL CANADIAN SOIL TYPES. ELEMENTAL ANALYSIS FOR C, H AND N SHOWED THAT THE SEDIMENT HUMIC AND FULVIC ACIDS ARE SIMILAR TO THOSE PRESENT IN SOILS EXCEPT FOR A RATHER HIGH NITROGEN CONTENT, WHICH IS THOUGHT TO BE A CONSEQUENCE OF THE RELATIVELY LARGER PROTEIN CONTENT OF THE LAKE'S PARENT MATERIAL, NAMELY SESTON. INFRA-RED SPECTRA GAVE SOME SUGGESTION OF THE PRESENCE OF POLYPEPTIDES AS WELL AS PROTEINS AND POLYSACCHARIDES. THE POLYPEPTIDE NATURE OF THE SEDIMENT FULVIC ACIDS AND COMBINED SOLUBLE AMINO ACIDS WAS ALSO SUGGESTED BY THE RELEASE OF FREE AMINO ACIDS WITH A PROTEOLYTIC ENZYME;

294 KEMP, ANTHONY L. W.; THOMAS, RICHARD L.;
IMPACT OF MAN'S ACTIVITIES ON THE CHEMICAL COMPOSITION IN THE SEDIMENTS OF LAKES ONTARIO, ERIE AND HURON;
(1976) WATER, AIR, AND SOIL POLLUTION 5:469-490;
CHEMICAL COMPOSITION; SEDIMENT; HEAVY METALS; MAN; NUTRIENT LOADING; MINERALOGY;
7809; GCODE3; GCODE4; GCODE5; GCODE6;
THE CONCENTRATIONS OF ORGANIC MATTER, MAJOR ELEMENTS AND TRACE ELEMENTS WERE DETERMINED AT 14 CORE LOCATIONS IN LAKES ONTARIO, ERIE AND HURON. THE CHEMICAL COMPOSITION OF THE CORES WAS RELATED TO THE SEDIMENT PARTICLE SIZE, EH, PH, CHRONOLOGY AND LOCATION OF SAMPLING SITE. CONCENTRATIONS OF SI, AL, FE, MG, TI, K AND NA, WHICH REPRESENT THE MAJOR MINERAL SPECIES IN THE SEDIMENTS, ARE GENERALLY UNIFORM IN EACH CORE. SURFACE ENRICHMENTS OF HG, PB, ZN, CD, CU, BE, V, ORG-C, N AND P ARE OBSERVED AT MOST LOCATIONS, WITH THEIR CONCENTRATIONS, USUALLY MUCH GREATER ABOVE THE AMBROSIA HORIZON (~120 YR BP), IRRESPECTIVE OF DEPTH OF THE HORIZON. THE ENRICHMENT OF THESE ELEMENTS IS ATTRIBUTED TO ANTHROPOGENIC INPUTS IN RECENT YEARS. CONCENTRATION PROFILES FOR MN AND S ARE RELATED TO THE MIGRATION OF THESE ELEMENTS IN THE PORE WATERS. ANTHROPOGENIC LOADINGS OF THE TRACE METALS AND NUTRIENTS PARALLEL THE POPULATION AND DEGREE OF INDUSTRIALIZATION OF EACH LAKE DRAINAGE BASIN. NATURAL LOADINGS PARALLEL THE SEDIMENTATION RATES. ALTHOUGH IT IS NOT POSSIBLE TO EVALUATE THE CONTRIBUTIONS OF THE TRACE METALS FROM VARIOUS SOURCES, EVIDENCE IS PRESENTED THAT ATMOSPHERIC INPUTS ARE IMPORTANT.;

295 KEMP, ANTHONY L. W.; WONG, HENRY K. T.;
MOLECULAR-WEIGHT DISTRIBUTION OF HUMIC SUBSTANCES FROM LAKES ONTARIO AND ERIE SEDIMENTS;
(1974) CHEMICAL GEOLOGY 14(1-2):15-22;
HUMIC ACIDS; SEDIMENT; INTERSTITIAL WATER; ORGANIC MATTER; LAKES; FULVIC ACIDS; MEASUREMENT;
3906; CAN-CCIW-CR-7; GCODE4; GCODE5;
THE RELATIVE MOLECULAR-WEIGHT DISTRIBUTION OF HUMIC ACIDS, FULVIC ACIDS AND INTERSTITIAL WATER, EXTRACTED FROM THE SURFACE SEDIMENTS OF LAKES ONTARIO AND ERIE, WAS DETERMINED BY SEPHADEX GEL FILTRATION. ON THE BASIS OF MOLECULAR WEIGHT, MOST OF THE ORGANIC MATTER CAN BE DIVIDED INTO 3 DISTINCT APPARENT MOLECULAR WEIGHT RANGES: (1) COMPONENTS WITH MOLECULAR WEIGHT LESS THAN [illegible] (HUMIC ACIDS 1-2%, FULVIC ACIDS 20-23%, INTERSTITIAL WATER 70-80%), (2) COMPONENTS WITH MOLECULAR WEIGHT FROM [illegible] TO 10,000 (HUMIC ACIDS 27-48%, FULVIC ACIDS 23-35%, INTERSTITIAL WATER 4-11%), AND (3) MOLECULAR WEIGHTS GREATER THAN 200,000 (HUMIC ACIDS 25-[illegible]%, FULVIC ACIDS 18-29%, INTERSTITIAL WATER 0%.;

296 KEMPE, LLOYD L.;
MICROBIAL DEGRADATION OF THE LAMPREY LARVICIDE 3-TRIFLUOROMETHYL-4-NITROPHENOL IN SEDIMENT-WATER SYSTEMS;
(1973) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 16. 16 PP.;
LAMPRICIDES; TFM; PETROMYZON MARINUS; RIVERS; LAKES; CARASSIUS AURATUS; METHODS; FLUORIDES; TEMPERATURE; NUTRIENTS; PHENOLS; WATER;
GLF-TR18; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE SELECTIVE LAMPRICIDE 3-TRIFLUOROMETHYL-4-NITROPHENOL (TFM), MAINTAINED IN THE WATER AT CONCENTRATIONS OF [illegible] TO 8 UG/ML FOR SEVERAL HOURS, KILLS LARVAL SEA LAMPREYS (PETROMYZON MARINUS) IN TRIBUTARIES OF THE GREAT LAKES. BECAUSE THE FATE OF TFM IN THE ENVIRONMENT IS A MATTER OF CONCERN, THE INTERACTIONS OF THIS CHEMICAL WITH RIVER AND LAKE SEDIMENTS WERE STUDIED IN LABORATORY EXPERIMENTS.

IN MIXTURES OF TFM, WATER, AND SEDIMENT HELD IN AQUARIUMS, THE TFM DECREASED PROGRESSIVELY AND NEARLY OR COMPLETELY DISAPPEARED IN 1 TO 4 WEEKS; CONCENTRATIONS OF THE FLUORIDE ION INCREASED; AND THE SYSTEMS BECAME NONTOXIC FOR SEA LAMPREY LARVAE AND GOLDFISH (CARASSIUS AURATUS). IF THE REDUCTION IN TFM CEASED BEFORE ALL OF THE CHEMICAL HAD DISAPPEARED, THE PROCESS RESUMED WHEN NUTRIENT BROTH WAS ADDED. LOSS OF TFM FROM THE SYSTEMS WAS PREVENTED BY THE ADDITION OF AN ANTISEPTIC (PHENOL) AND BY HEAT STERILIZATION. ENRICHMENT CULTURES OF MICROORGANISMS ISOLATED FROM STREAM AND LAKE SEDIMENTS DEGRADED TFM IN NUTRIENT BROTHS. I CONCLUDE THAT TFM IS DEGRADED BY MICROORGANISMS THAT LIVE IN SEDIMENT-WATER SYSTEMS.;

297 KENNEDY, WILLIAM A.;
CURRENT FISHERIES RESEARCH BY CANADIANS ON THE GREAT LAKES;
(1956) TRANSACTIONS OF THE AMERICAN FISHERIES SOCIETY. VOL. 86. PP419-423;
FISHERIES; RESEARCH; CANADA; PETROMYZON MARINUS; ELECTRICAL LAMPREY BARRIERS;
2222; GCODE6;
THE ACTIVITIES INDICATED ARE REVIEWED. THEY FALL INTO TWO CATEGORIES: 1. A CONTRIBUTION TOWARDS ELIMINATING SEA LAMPREY FROM THE GREAT LAKES; 2. SOME GENERAL FISHERY RESEARCH;

298 KILGOUR, WILLIAM J.;
MIDDLE SILURIAN CLINTON RELATIONSHIPS OF WESTERN NEW YORK AND ONTARIO;
(1966) GEOLOGY OF WESTERN NEW YORK GUIDEBOOK, NY STATE GEOLOGICAL ASSOC 36TH ANNUAL MEETING, PP10-18;
MINERALOGY; GEOLOGY; NY;
NYG-36; GCODE5A4; GCODE5B2;

299 KILHAM, PETER; TILMAN, DAVID G.;
SOME BIOLOGICAL EFFECTS OF ATMOSPHERIC INPUTS TO LAKES: NUTRIENT RATIOS AND COMPETITIVE INTERACTIONS BETWEEN PHYTOPLANKTON;
(1975) ATMOSPHERIC CONTRIBUTION TO THE CHEMISTRY OF LAKE WATERS. PROCEEDINGS 1ST SPECIALTY SYMPOSIUM. PP. 187-191.;
PHYTOPLANKTON; THERMAL; STRATIFICATION; NUTRIENTS; EPILIMNION; AIR; LAKES;
5246; GCODE6;
ATMOSPHERIC INPUTS TO THE GREAT LAKES DO NOT SUPPLY THE NUTRIENTS COMMONLY LIMITING THE GROWTH OF PHYTOPLANKTONIC ALGAE IN THE SAME PROPORTIONS AS OCCUR IN THE SURFACE WATERS OF THE GREAT LAKES. THIS UNBALANCED SUPPLY OF NUTRIENTS COULD CHANGE THE COMPETITIVE RELATIONSHIPS BETWEEN SPECIES AND DISRUPT THE USUAL PATTERNS OF DOMINANCE AND SEASONAL SUCCESSION. ATMOSPHERIC INPUTS OF DELETERIOUS COMPOUNDS SUCH AS POLYCHLORINATED HYDROCARBONS MAY HAVE SIMILAR EFFECTS.

300 KIMBALL, THOMAS L.;
OUR NATIONAL EQ;
(1969) NATIONAL WILDLIFE. 13PP.;
POLLUTION; AIR POLLUTION; WATER; REGULATION; EROSION; RESOURCES; ECOLOGY;
1468; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

301 KING, DONALD S.;
REGIONAL WATER AND WASTE WATER PLANS;
(1974) BLACK RIVER-ST. LAWRENCE REGIONAL PLANNING BOARD TECHNICAL SERIES REPORT NUMBER 14, 44P, 4 MAPS;
WATER SUPPLY; DEVELOPMENT PLANNING; HYDROLOGY; SEWERS;
BSRP-T1C; GCODE5D4; GCODE5D5; GCODE7;
THIS REPORT IS AN INVENTORY, ANALYSIS AND PRESENTATION OF EXISTING AND PLANNED PUBLIC WATER AND WASTEWATER FACILITIES IN THE BLACK RIVER-ST. LAWRENCE REGION. THE STUDY IS DIVIDED INTO 3 MAJOR SECTIONS. FIRST, AN OVERVIEW OF AVAILABLE BASE DATA AND THE GENERAL RATIONALE FOR THE DEVELOPMENT OF CENTRALIZED WATER/SEWER SYSTEMS IS DEVELOPED. NEXT, WATER SUPPLY AND WASTEWATER TREATMENT SYSTEMS ARE INVENTORIED SEPARATELY IN THE FORMATION OF SHORT (5 YRS) AND LONG (5-25 YRS) RANGE PLANNING PROGRAMS. THESE 2 PROGRAMS CULMINATE A MULTI-YEAR INVOLVEMENT BY THE RPB IN THE FUNCTIONAL AREAS OF WATER SUPPLY AND SEWERAGE TREATMENT SYSTEMS PLANNING;

302 KING, DONALD S.;
WATER SUPPLY AND SEWAGE SYSTEMS PLANNING PROGRAM;
(1973) BLACK RIVER-ST. LAWRENCE REGIONAL PLANNING BOARD COMPREHENSIVE PLANNING SERIES REPORT NO. 4, 51P;
WATER SUPPLY; WATER QUALITY; MANAGEMENT; DEVELOPMENT PLANNING; EFFLUENTS; SEWERS;
BSRP-C4; GCODE5D4; GCODE5D5; GCODE7;
THE PURPOSE OF THIS REPORT IS AN INITIAL ATTEMPT BY THE REGIONAL PLANNING BOARD TO DEFINE: (1) GOALS AND OBJECTIVES SPECIFICALLY RELATED TO WATER QUALITY MANAGEMENT PLANNING, (2) THE DIFFERING FEDERAL AGENCIES THAT NOT ONLY FUND MUNICIPAL WATER/SEWER PROJECTS, BUT HAVE BECOME AWARE OF THE ROLES, JURISDICTIONS, AND INTERRELATIONSHIPS OF STATE AGENCIES INVOLVED WITH SIMILAR WATER QUALITY MANAGEMENT INTERESTS, AND THEIR LEGISLATED REGULATORY POWERS, (4) COUNTY AND LOCAL GOVERNMENTS' PLANNING EXPERIENCES AND DIRECTIONS, (5) THE COORDINATIVE ROLE THAT THE RPB CAN FULFILL TO ACT NOT ONLY AS AN INFORMATIONAL CENTER, BUT A MEDIATORY BETWEEN LOCAL GOVERNMENT AND STATE AND FEDERAL GOVERNMENTAL AGENCIES, AND (6) A PROGRAM WHEREBY ENVIRONMENTAL HEALTH FACILITIES' PLANS ARE ATTUNED TO THE DESIRES, GOALS, AND FINANCIAL CAPABILITIES OF REGIONAL RESIDENTS;

303 KING, DONALD; MEABON, DORA;
RECREATIONAL TRAILS AND CANOE ROUTES;
(1975) BLACK RIVER-ST. LAWRENCE REGIONAL PLANNING BOARD. TECHNICAL REPORT NO. 14, 43P;
RECREATION; FACILITIES;
BSRP-T14; GCODE5D4; GCODE5D5; GCODE7;
THIS REPORT INVENTORIES DESIGNATED SCENIC ROADS, HIKING TRAILS, CANOE ROUTES, ALPINE ANDNNORDIC SKI TRAILS AND HORSEBACK RIDING TRAILS IN THE REGION. ILLUSTRATIVE MAPS ARE INCLUDED TO AID IN LOCATION OF ALL RECREATIONAL TRAILS AND CANOE ROUTES. 2 SECTIONS, HOWEVER, GO BEYOND A SIMPLE INVENTORY OF PUBLISHED MATERIALS. A POTENTIAL CANOE ROUTE IS DESCRIBED AND MAPPED ILLUSTRATING AN UNDEVELOPED REGIONAL RECREATIONAL ASSET. SECONDLY, INVESTIGATION OF RIGHTS-OF-WAY ASSOCIATED WITH HIGHWAYS, RAILROADS, PIPELINES AND ELECTRICAL TRANSMISSION LINES IS MADE TO ASSESS POTENTIAL RECREATIONAL TRAIL USE.

304 KING, JOHN S.;
THE ECONOMIC GEOLOGIC SETTING OF WESTERN NEW YORK;
(1966) GEOLOGY OF WESTERN NEW YORK GUIDEBOOK, NY STATE GEOLOGICAL ASSOC 38TH ANNUAL MEETING, PP69-74;
GEOLOGY; MINERALOGY; ECONOMICS; NY; NYG-38;
GCODE4G5; GCODE5A4;

305 KINKEAD, JOHN D.;
AVAILABILITY OF INFORMATION ON THE AMBIENT CHEMISTRY OF THE LAKE ONTARIO NEARSHORE ZONE;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P165;
CHEMISTRY; WATER; COASTAL ZONE;
IJC-WA7; GCODE5A4; GCODE5A2; GCODE5A1; GCODE5A3; GCODE5B1; GCODE5B3; GCODE5C1; GCODE5C3; GCODE5C4; GCODE5D1; GCODE5D2; GCODE5D4;

306 KLEMM, DONALD J.;
A REVIEW OF THE LEECHES (ANNELIDA: HIRUDINEA) IN THE GREAT LAKES REGION;
(1977) MI ACADEMICIAN 9(4):397-418;
AQUATIC INVERTEBRATES; ANNELIDA; HIRUDINEA; TAXONOMY;
7792; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

307 KNOX, JAMES; FALKNER, CHARLES; NEUMAN, PATRICK; RETTIG, STEPHEN; SKAVRONECK, STEVEN; THOMAS, DAVID;
AN ANALYSIS OF THE INTERNATIONAL GREAT LAKES LEVELS BOARD REPORT ON REGULATION OF GREAT LAKES WATER LEVELS: HYDROLOGY;
(1976) UNIVERSITY OF WISCONSIN. INSTITUTE FOR ENVIRONMENTAL STUDIES;
WATER LEVELS; REGULATION; ECONOMICS; IMPACT; DATA PROCESSING; COMPUTER PROGRAMS;

WI-UIES-27; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

308 KRAMER, JAMES R.; RODGERS, G. KEITH;
NATURAL PROCESSES AND WATER QUALITY CONTROL;
(1968) PROC GREAT LAKES WATER RESOURCES CONF, PP419-452;
WATER QUALITY; CONTROL; MODEL STUDIES;
CAN-EIC-1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
NATURAL PROCESSES ARE THE BASIS UPON WHICH LONG RANGE MANAGEMENT PLANS MUST BE BASED. NATURAL PROCESSES ARE DYNAMIC, AND SOME PROCESSES ARE IRREVERSIBLE. GENERALLY IRREVERSIBILITY (NON-EQUILIBRIUM) BECOMES MORE SEVERE AS POLLUTION INCREASES. THE GREAT LAKES APPROACH SMALL OCEANS IN SIZE, AND EACH GREAT LAKE HAS ITS UNIQUE CHARACTERISTIC WITH REGARD TO ASSIMILATION OF CONSTITUENTS. THIS IS EXPRESSED IN VARYING SIZE (PARTICULARLY DEPTH), BOTTOM SEDIMENT, CURRENT PATTERN, AND EMPTYING RATE. DEVIATION FROM TIME INDEPENDENT EQUILIBRIUM FOR MAJOR INORGANIC IONS AND FIRST ORDER RATE REACTIONS FOR BIOLOGICAL SPECIES CAN BE USED TO DIAGNOSE DEGRADATION FACTORS. EXCESS CARBON DIOXIDE, OXYGEN DEFICIENCY, EXCESS PHOSPHATE (RELATIVE TO SATURATION WITH HYDROXYAPATITE) ARE 3 MEASURES OF WATER QUALITY. RATES OF CELL DIVISION UNDER CONTINUOUSLY FAVORABLE CONDITIONS (NUTRIENTS, TEMPERATURE, LOW TURBIDITY) PREDICT BLOOM CONDITIONS IN CYCLES OF ONE WEEK. ATTEMPTS TO MAINTAIN CONDITIONS NEAR REVERSIBILITY ARE IMPORTANT RELATIVE TO OBTAINING HIGH QUALITY WATER OVER LONG PERIODS OF TIME. ENGINEERING DESIGN MUST INCORPORATE NEW TECHNOLOGY BASED UPON KNOWLEDGE OF NATURAL PROCESSES IN ORDER TO OBTAIN THIS CONDITION.;

309 KUNDELL, JAMES E;
A CHEMICAL AND PHYSICAL COMPARISON OF LITTLE SODUS BAY, PORT BAY, SODUS BAY, AND IRONDEQUOIT BAY;
(1974) RICE CREEK BIOLOGICAL FIELD STATION BULLETIN, 1(1):7-31;
EMBAYMENTS; CHEMICAL COMPOSITION; PHYSICAL CHARACTERISTICS; TEMPERATURE; LIGHT; RADIATION; ALKALINITY; DISSOLVED OXYGEN; HARDNESS;
NY-LOS-B1974-_; GCODE5C2; GCODE5D5; GCODE5;

310 KURCZEWSKI, FRANK E.; ALM, STEVEN R.; MUNGARI, ROBERT J.;
INSECTS OF THE ST. LAWRENCE RIVER;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP167-174;
INSECTA; SPECIES DIVERSITY;
NY-CS-PR-SL; GCODE7;

311 KWIATKOWSKI, ROY E;
SCENARIO FOR AN ONGOING CHLOROPHYLL A SURVEILLANCE PLAN ON LAKE ONTARIO FOR NON-INTENSIVE SAMPLING YEARS;
(1978) J GREAT LAKES RES, 4(1):19-26;
CHLOROPHYLL-A; SAMPLE COLLECTION; METHODS; SURVEILLANCE;
7792; GCODE5;
THE PRESENT STUDY PROPOSES AN EFFECTIVE NON-INTENSIVE SAMPLING PROGRAMME FOR CHLOROPHYLL A ON LAKE ONTARIO. 3 YRS OF CHLOROPHYLL DATA WERE USED TO ESTABLISH 3 STATISTICALLY HOMOGENEOUS ZONES, SIGNIFICANTLY DIFFERENT AT THE 5% LEVEL. THESE ZONES ARE REFERRED TO AS OFFSHORE, INSHORE AND POINT SOURCE AREAS. THE SEASONAL CYCLE FOR EACH ZONE IS PRESENTED AS IS THE NUMBER OF SAMPLES NEEDED TO ESTIMATE THE MEAN OF EACH ZONE WITHIN 1%, 5% AND 10% OF THE TRUE MEAN, WITH A 95% CONFIDENCE LEVEL;

312 KWIATKOWSKI, ROY E.; EL-SHAARAWI, ABDEL H.;
PHYSICO-CHEMICAL SURVEILLANCE DATA OBTAINED FOR LAKE ONTARIO, 1974 AND THEIR RELATIONSHIP TO CHLOROPHYLL A;
(1977) J GREAT LAKES RES 3(1-2):132-143;
CHLOROPHYLL-A; BIOMASS; LAKES; EUTROPHICATION; ALGAE; PHYTOPLANKTON; WATER; POLLUTION; MONITORING; DEPTH; TEMPERATURE; SECCI DEPTH;
GCODE5;
A VARIETY OF CHEMICAL AND PHYSICAL PARAMETERS WERE MEASURED ON 15 CRUISES CONDUCTED ON LAKE ONTARIO FROM APRIL TO NOVEMBER, 1974. ANALYSIS OF CHLOROPHYLL A, INCLUDING PHEOPIGMENTS, INDICATED THAT CHLOROPHYLL CONCENTRATIONS FOLLOWED A BIMODAL SEASONAL PATTERN. SIGNIFICANT CORRELATIONS WERE FOUND BETWEEN

CHLOROPHYLL A AND THE OTHER PARAMETERS MEASURED. FIRST ORDER AUTOREGRESSIVE EQUATIONS WERE ESTABLISHED FOR ALL MEASURED PARAMETERS. MULTIPLE REGRESSION ANALYSES INDICATED THAT 74% OF THE SPRING, 49% OF THE SUMMER AND 76% OF THE FALL VARIABILITY IN CHLOROPHYLL A CONCENTRATION COULD BE EXPLAINED WITH THE PHYSICO-CHEMICAL PARAMETERS MEASURED IN THE PRESENT STUDY.;

313 LACKEY, JAMES A.;
SMALL MAMMALS OF THE ST. LAWRENCE RIVER SYSTEM;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP189-216;
MAMMALIA; HABITAT; SPECIES DIVERSITY;
NY-US-PR-SL; GCODE7;

314 LAFHY, GILLMAN J.;
WASTEWATER TREATMENT PLANT PERSONNEL: IMAGE AND TRAINING;
(1971) J. WATER POLLUTION CONTROL FEDERATION. VOL. 43. NO. 7. PP1439-1443;
WASTE TREATMENT; EDUCATION; NY; BUFFALO; GREAT LAKES LAB; POLLUTION; CONTROL;
2668; GCODE5A4T3;

315 LANDSBERG, DENNIS R.; SCOTT, JON T.; FENLON, MARK;
SUMMER CIRCULATION PATTERNS NEAR NINE MILE POINT, LAKE ONTARIO;
(1970) PROC. 13TH CONF. ON GREAT LAKES RES. PART 1. PP444-452;
CURRENTS; VOLUME AND CURRENT FLOW;
3045; GCODE5D3; GCODE5D5;
MEASUREMENTS OF CURRENT SPEED AND DIRECTION BY CURRENT METER AND DROGUES WERE OBTAINED IN JULY AND AUGUST 1969 ON THREE BUOY LINES LOCATED NEAR EAST NINE MILE POINT ON THE SOUTH SHORE OF LAKE ONTARIO. TRANSPORT WAS FOUND TO BE NORTHEASTWARD FORMING A COASTAL CURRENT WITH SPEEDS FROM 5 TO 40 CM/SEC. THE SPEED OF THIS CURRENT DECREASED RAPIDLY BELOW THE THERMOCLINE. THE COASTAL CURRENT WAS WEAKER NEAR NINE MILE POINT THAN 10 TO 30 KM WEST BECAUSE THIS CURRENT TURNS NORTHWARD NEAR OSWEGO. THE DYNAMIC HEIGHT PATTERN SHOWS A NEAR-SHORE COUNTERCURRENT FORMING AN EDDY WEST OF NINE MILE POINT;

316 LANE, ROBERT K.;
GREAT LAKES THERMAL STUDIES USING INFRARED IMAGERY;
(1970) LIMNOLOGY AND OCEANOGRAPHY. VOL. 15. NO. 2. PP296-300;
REMOTE SENSING; THERMAL; RESEARCH;
1792; GCODE5A;
EXAMPLES OF MOSAICS OF INFRARED IMAGERY OF THE WESTERN END OF LAKE ONTARIO ARE USED TO DEMONSTRATE THEIR VALUE IN REVEALING DETAILED SURFACE THERMAL PATTERNS. ADDITIONAL DATA FROM AIRBORNE THERMOMETRY AND SHIPBOARD MEASUREMENTS CONFIRM THE INTERPRETATION OF LARGE-SCALE DYNAMIC PROCESSES. SMALLER SCALE PHENOMENA, SUCH AS INTERNAL WAVE PATTERNS AND SMALL EDDIES, ARE ALSO INTERPRETABLE;

317 LANGE, WILLY;
CYANOPHYTA-BACTERIA SYSTEMS: EFFECTS OF ADDED CARBON COMPOUNDS OR PHOSPHATE ON ALGAL GROWTH AT LOW NUTRIENT CONCENTRATIONS;
(1970) J PHYCOLOGY 6(3) PP230-234;
CYANOPHYTA; BACTERIA; ALGAE; CARBON; PHOSPHATES; NUTRIENTS; GROWTH; CARBON DIOXIDE; CULTURING; PHYTOPLANKTON; ANABAENA; ANACYSTIS; GLOEOTRICHIA; LYNGBYA; MICROCYSTIS; NOSTOC; OSCILLATORIA; PHORMIDIUM;
6765; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
PLANKTONIC BLUE-GREEN ALGAE ARE KNOWN TO BE ALWAYS ASSOCIATED WITH BACTERIA. EARLIER WORK HAS SHOWN THAT THE ADDITION OF BACTERIA-ASSIMIBLE CARBON SOURCE TO A NORMAL ZEHNDER-GORHAM CULTURE MEDIUM (NO. 11) WILL PRODUCE ENHANCED GROWTH OF THESE ALGAE WHEN ATMOSPHERIC CO2 HAS BECOME THE LIMITING FACTOR. IN NEW YORK, PHOSPHATE-RICH CULTURE MEDIA WERE DILUTED SO THAT THEY SIMULATED NUTRIENT LEVELS FOUND IN THE GREAT LAKES, E.G., LAKE ERIE. AT THESE LOW CONCENTRATIONS AND WHEN ATMOSPHERIC CO2 WAS NOT AVAILABLE IN A SUFFICIENT SUPPLY, THE ADDITION OF SUCROSE TO EITHER A 1/100 OR A 1/1000 DILUTED Z-G MEDIUM (10 MG OR 2 MG OF SUCROSE, RESPECTIVELY) ALSO PRODUCED ENHANCED GROWTH OF THE TESTED BLUE-GREEN ALGAE. THE STIMULATION OF ALGAL GROWTH WAS APPARENTLY DUE TO AN INCREASED BACTERIAL PRODUCTION OF CO2 AND POSSIBLY OTHER CARBON COMPOUNDS APPROACHING THE COMPOSITION OF THE CO2 MOLECULE. THE LITERATURE SUGGESTS THAT DURING VIGOROUS

ALGAL GROWTH IN LAKES, ATMOSPHERIC CO2 WILL BE SEVERELY LIMITING. PRODUCTIVE LAKES ALWAYS CONTAIN NONLIVING ORGANIC MATTER. THE PRESENCE OF BACTERIA-ASSIMIBLE MATTER IS PROBABLY ONE OF THE IMPORTANT FACTORS LEADING TO ALGAL BLOOM.;

318 LANSING, LIVINGSTON ;
AIR MASS MODIFICATION BY LAKE ONTARIO DURING THE APRIL-NOVEMBER PERIOD;
(1965) U OF MI GREAT LAKES RES DIVISION PROC 8TH CONF GREAT LAKES RES, P257-261;
METEOROLOGY; WEATHER MODIFICATION;
IGR-CE-1965; GCODE5;
THIS PAPER DISCUSSES THE IMPORTANT ROLE THE GREAT LAKES PLAY ON THE WEATHER AND THE CLIMATE MODIFICATIONS OF THE SURROUNDING AIR MASSES, BY MEANS OF A STUDY OF THE NORTHEASTERN LAKE ONTARIO REGION. THE STUDY DESCRIBES THE CHANGING PATTERNS OF AIR MASS MODIFICATIONS AS THE SEASON PROGRESSES FROM SPRING THROUGH THE HEAT OF MID SUMMER TO LATE FALL, WHEN ICE BEGINS TO FORM IN THE HARBORS OF THE LAKE. IT IS INDICATED THAT THE LAKE PLAYS A MORE IMPORTANT ROLE ON THE MODIFICATION OF AIR MASSES IN THE FALL AND EARLY WINTER;

319 LAPWORTH, E. D.;
THE EFFECT OF FRY PLANTINGS ON WHITEFISH PRODUCTION IN EASTERN LAKE ONTARIO;
(1956) J. FISHERIES RES. BOARD OF CANADA. VOL. 13. NO. 4. PP547-556;
FISH; FISH STOCKING; FRY; COREGONUS CLUPEAFORMIS; COMMERCIAL FISHERIES;
2504; GCODE5C4; GCODE5C2; GCODE5D1;
WHITEFISH FRY WERE PLANTED IN THE BAY OF QUINTE AND ADJACENT WATERS IN NUMBERS VARYING FROM 206 MILLIONS IN 1927 TO NONE IN 1945. SINCE 50% OF THE COMMERCIAL WHITEFISH CATCH FROM THESE WATERS CONSISTED OF FIVE-YEAR-OLD FISH, WHITEFISH PRODUCTION IN EACH OF THE YEARS FROM 1929 TO 1951 WAS COMPARED TO THE NUMBER OF FRY PLANTED 5 YEARS PREVIOUSLY (1924-1946). NO CORRELATION COULD BE FOUND BETWEEN THE NUMBER OF FRY PLANTED AND THE PRODUCTION OF WHITEFISH 5 YEARS LATER. THE LARGEST NUMBER OF FRY PLANTED (206 MILLIONS IN 1927) WAS FOLLOWED BY THE LOWEST PRODUCTION OF THE ENTIRE PERIOD (95 THOUSAND POUNDS IN 1932). ON THE OTHER HAND, FOLLOWING NO PLANTING IN 1945, PRODUCTION IN 1950 WAS APPROXIMATELY NORMAL (226 THOUSAND POUNDS). THE AGE COMPOSITION OF THE COMMERCIAL CATCH IN THE YEARS 1944-1951 WAS DETERMINED FROM SCALE SAMPLES. BY APPLYING THE AGE COMPOSITION TO THE TOTAL CATCHES IN THESE YEARS THE CONTRIBUTIONS OF THE YEAR-CLASSES 1940-1945 HAVE BEEN ESTIMATED. THE NUMBER OF FRY PLANTED PROBABLY DID NOT AFFECT THE CONTRIBUTION OF THESE YEAR-CLASSES TO THE FISHERY;

320 LEAF, ALBERT L; COFFEY, PETER G; FERRELL, JOHN E;
PHYSIOGRAPHY, GEOLOGY AND SOILS;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 159P;
GEOMORPHOLOGY; PHYSIOGRAPHY; SOIL; LAND USE; WILDLIFE; HABITAT;
SLE-ST1; GCODE5D4; GCODE5D5; GCODE7;
THE REGION WITHIN THE ST LAWRENCE-EASTERN ONTARIO SHORELINE PROJECT MAY BE CHARACTERIZED AS HAVING RELATIVELY COMPLEX GEOLOGIC CHARACTERISTICS AND RELATIVELY MODERATE SURFACE RELIEF FEATURES. THE SOILS ARE STRONGLY INFLUENCED BY GLACIATION AND RELATIVELY HIGH SEASONAL WATER TABLE. THERE IS TREMENDOUS DIVERSITY AMONG THE SOILS OF THE REGION. THE SOIL DIVERSITY IS BOTH OF A LOCAL NATURE, WITH INTRICATE MIXTURES OF VERY DIFFERENT SOIL TYPES, E.G., DEEP TO SHALLOW, CLAYEY TO SANDY, IN ADJACENT LOCALES; AND ALSO OF AN EXTENSIVE NATURE, E.G., ST LAWRENCE COUNTY SOILS ARE GENERALLY SANDIER, MORE FRIABLE, AND DEEPER THAN THE JEFFERSON COUNTY SOILS. IT IS STRESSED THAT THERE IS CONSIDERABLE GENERALIZING IN THE SOIL MAP, WHICH MUST BE RECOGNIZED. IT IS STRONGLY RECOMMENDED THAT THOROUGH ON-SITE INVESTIGATION OF SOIL CONDITIONS BE CONDUCTED FOR ANY MAJOR DEVELOPMENT PLANNED ON SPECIFIC LOCATIONS. AS A RESULT OF THE CHARACTERISTICS OF THE SOILS IN THE AREA, PRIMARILY SOIL DRAINAGE AND DEPTH TO SEASONAL WATER TABLE, THE SOILS HAVE BEEN RATED FOR SEVERAL USES. EACH SOIL SERIES HAS BEEN GROUPED INTO SOIL MAPPING UNITS AND IS PRESENTED WITH INTERPRETIVE INFORMATION. EACH INTERPRETATION PROVIDES A NUMBER OF IMPLICATIONS OF THE PARTICULAR SOIL SERIES FOR DEVELOPMENT OR USE FOR A VARIETY OF PURPOSES. THESE ARE MEANT AS A "STEPPING-OFF-POINT" FOR OTHERS, BY WHICH THEY MIGHT PRESENT A MORE DETAILED DISCUSSION OF THE CRITICAL RELATIONSHIPS WHICH EXIST;

321 LEE, ALLAN H.; RODGERS, G. KEITH;
TEMPERATURE FINE STRUCTURE IN LAKE ONTARIO;
(1972) LIMNOL AND OCEAN 17(5):672-677;
TEMPERATURE; TEMPERATURE GRADIENTS;
3299; GCODE5C3; GCODE5C4; GCODE5C5; GCODE5D2; GCODE5D3;
VERTICAL TEMPERATURE PROFILES OBTAINED IN LAKE ONTARIO DURING MAY AND JUNE OF 1970 REVEALED THE PRESENCE OF CONSIDERABLE FINE STRUCTURE IN THE THERMAL REGIME. LOCAL FEATURES SUCH AS SMALL-SCALE TEMPERATURE INVERSIONS AND ISOTHERMAL LAYERS WERE OBSERVED AT VARIOUS DEPTHS ON MORE THAN HALF THE PROFILES. SOME COMPARISONS ARE MADE BETWEEN FRESHWATER FINE STRUCTURE AND ITS OCEANIC COUNTERPART.;

322 LEE, G. FRED; COWEN, WILLIAM F.; SRIDHARAN, NAGALAZMI;
ALGAL NUTRIENTS AVAILABILITY AND LIMITATION IN LAKE ONTARIO DURING IFYGL;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP71-89;
NUTRIENTS; CLADOPHORA; PHYTOPLANKTON; ALGAE; CHLOROPHYTA; PHOSPHORUS; PHOSPHORUS LOADING; NUTRIENT LOADING; IFYGL; RESEARCH; PROGRAMS;
US-EPA-660/3-73-021; GCODE5C2T5; GCODE5A4T5; GCODE5D3T4; GCODE5D4T1;

323 LEE, G. FRED; HAILE, CLARENCE;
EXPLORATION OF HALOGENATED AND RELATED HAZARDOUS CHEMICALS IN LAKE ONTARIO;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP110-122;
HALOGENS; PCB; CHLOROPHENOLS; ANALYSIS, CHEMICAL COMPOSITION; WATER; FISH; SEDIMENT; BENTHOS; PHYTOPLANKTON; ALGAE;
US-EPA-660/3-73-021; GCODE5;

324 LERMAN, ABRAHAM; WEILER, ROLAND R.;
DIFFUSION AND ACCUMULATION OF CHLORIDE AND SODIUM IN LAKE ONTARIO SEDIMENT;
(1970) EARTH AND PLANETARY SCIENCE LETTERS. VOL. 10. NO. 1. PP150-156;
SEDIMENT; SODIUM; CHLORIDE; ACCUMULATION; DIFFUSION; LAKES; WATER;
2285; GCODE5;

325 LESHKEVICH, GEORGE A.;
GREAT LAKES ICE COVER, WINTER 1975-76;
(1977) US DEPT. OF COMMERCE. NOAA TECHNICAL MEMORANDUM ERL GLERL-12. 35PP;
ICE COVER;
US-CM-TM-ERL-GLERL12; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
FROM ICE-COVER DATA RECEIVED AT THE GREAT LAKES ENVIRONMENTAL RESEARCH LABORATORY DURING THE PAST WINTER, 19 COMPOSITE ICE CHARTS WERE PRODUCED TO ILLUSTRATE ESTIMATED ICE DISTRIBUTIONS AND CONCENTRATIONS ON THE GREAT LAKES AT WEEKLY INTERVALS FROM MID-DECEMBER 1975 THROUGH MID-APRIL 1976. ACCORDING TO THE DEFINITIONS OF MILD, NORMAL, AND SEVERE WINTERS SET FORTH BY RONDY (1971), FREEZING DEGREE-DAY ACCUMULATIONS INDICATE THAT THE 1975-76 WINTER WAS NORMAL FOR ALL LAKES. ACCUMULATIONS WERE AT THEIR SEASONAL MAXIMUM ON 21 MARCH IN THE NORTHERN PORTION OF THE GREAT LAKES AND ON 6 FEBRUARY IN THE SOUTHERN PORTION. SKIM ICE WAS REPORTED DURING LATE NOVEMBER AND EARLY DECEMBER AT VARIOUS SITES AROUND THE GREAT LAKES. FREEZEOVER WAS REPORTED IN LATE NOVEMBER ON SOME BAYS AND PROTECTED AREAS OF LAKE SUPERIOR AND THE LOWER ST. MARYS RIVER AND NEAR MID-DECEMBER AT OTHER SITES ON THE GREAT LAKES, INCLUDING PORTIONS OF GREEN BAY, SAGINAW BAY, AND LAKE ST. CLAIR. RESPONDING TO LOWER AVERAGE WEEKLY TEMPERATURES, ICE GROWTH CONTINUED ON THESE AND OTHER PROTECTED SHORE AREAS DURING THE WEEK ENDING 21 DECEMBER. DURING THE NEXT 2 WEEKS SLIGHTLY WARMER TEMPERATURES RETARDED ICE GROWTH, ESPECIALLY ON THE NORTHERN LAKES. ICE GROWTH INCREASED SUBSTANTIALLY DURING THE WEEK ENDING 11 JANUARY, REFLECTING COLDER AIR TEMPERATURES. ON THE AVERAGE, ICE COVERS INCREASED DURING LATE JANUARY, REACHING THEIR MAXIMUM EXTENTS DURING EARLY FEBRUARY ON ALL LAKES EXCEPT LAKE SUPERIOR, WHERE IT REACHED MAXIMUM NEAR MID-MARCH. MAXIMUM ICE EXTENT WAS ESTIMATED TO BE APPROXIMATELY 40 PERCENT ON LAKE SUPERIOR, 20 PERCENT ON LAKE MICHIGAN, 50 PERCENT ON LAKE HURON, 95 PERCENT ON LAKE ERIE, AND 20 PERCENT ON LAKE ONTARIO. WARMER TEMPERATURES DURING THE WEEK ENDING 15 FEBRUARY CAUSED SUBSTANTIAL LOSS OF ICE COVER ON MOST OF THE GREAT LAKES AND, EXCEPT FOR SHORT PERIODS OF RELATIVELY STABLE CONDITIONS, STARTED THE PERIOD OF ICE DETERIORATION ON THE SOUTHERN PORTION OF THE GREAT LAKES. ON THE NORTHERN PORTION OF THE LAKES ICE COVERS CONTINUED TO GROW OR REMAIN RELATIVELY STABLE UNTIL THE WEEK ENDING 21 MARCH, WHEN WARMER TEMPERATURES STARTED A PERIOD OF ICE DETERIORATION THAT

CONTINUED TO THE END OF THE SEASON. LAST REPORTS OF SIGNIFICANT ICE ON THE NORTHERN LAKES CAME NEAR MID-APRIL;

326 LEWIS, C. F. MICHAEL; MCNEELY, R. N.;
SURVEY OF LAKE ONTARIO BOTTOM DEPOSITS;
(1967) PROC 10TH CONF GREAT LAKES RES, P133-142;
BOTTOM; PHYSIOGRAPHY; SEDIMENTATION; SEDIMENT;
IGR-C10-1967; GCODE5;
SHORT GRAVITY CORES AND GRAB SAMPLES, RECOVERED DURING A CONTINUING RECONNAISSANCE SURVEY INITIATED IN 1966, WERE USED TO STUDY THE DISTRIBUTION, STRATIGRAPHY, AND CHRONOLOGY OF LAKE ONTARIO BOTTOM DEPOSITS. 3 MAJOR GROUPS OF SURFICIAL DEPOSITS WERE RECOGNIZED: (1) COMPLEX NEARSHORE SEDIMENTS, (2) GLACIOLACUSTRINE CLAYS, (3) POSTGLACIAL MUDS. ORGANIC CONTENTS OF 2 TO 6% AND MEDIAN PARTICLE DIAMETERS OF 1 TO 4 MICRONS ARE TYPICAL OF THE OFFSHORE SURFICIAL MUDS. POLLEN IN THESE SEDIMENTS FACILITATES CORRELATION AND SUBDIVISION AND INDICATES THAT THE PRESENT SEDIMENTATION RATE IN THE MAIN BASIN IS APPROXIMATELY 10 CM PER CENTURY. SEVERAL SEDIMENT SEQUENCES CONFIRM THE POSTGLACIAL LOW-LEVEL ADMIRALTY LAKE STAGE AND SUGGEST IT MAY HAVE REACHED LOWER LEVELS THAN PREVIOUSLY BELIEVED;

327 LICK, WILBERT J.;
NUMERICAL MODELING OF LAKE CURRENTS;
(1976) ANNUAL REVIEW OF EARTH AND PLANETARY SCIENCES. VOL. 4. PP. 49-74.;
MATHEMATICAL MODELS; AQUATIC SYSTEMS; CURRENTS; WATER; HYDRODYNAMICS;
5278; GCODE4; GCODE5;

328 LIPPSON, ALICE J.;
DEVELOPMENT OF A KEY TO THE FAMILIES OF GREAT LAKES FISH LARVAE;
(1976) US FISH AND WILDLIFE SERVICE PROC OF A WORKSHOP, PP26-31;
TAXONOMY; IDENTIFICATION; FISH; LARVAE;
US-IF-C1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

329 LIPPSON, ALICE J.;
DISTINGUISHING FAMILY CHARACTERISTICS AMONG GREAT LAKES FISH LARVAE;
(1976) US FISH AND WILDLIFE SERVICE PROC OF A WORKSHOP APPENDIX III, PP207-216;
TAXONOMY; FISH; LARVAE; IDENTIFICATION;
US-IF-C1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

330 LIU, PAUL C.;
A SUMMARY OF IFYGL SURFACE WAVE STUDIES;
(1977) IFYGL B NO 2, PP44-48;
WIND; WAVES; MEASUREMENT;
IFY-B21; GCODE5;

331 LOEHR, RAYMOND C.;
WATER POLLUTION PROBLEMS ASSOCIATED WITH ANIMAL WASTES AND INTENSIVE ANIMAL FEEDLOTS IN THE UNITED STATES PORTION OF THE GREAT LAKES BASIN;
(1974) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES VOLUME 1, PP152;
AGRICULTURAL POLLUTION; ENGINEERING; LAND USE; WATER QUALITY; GROUND WATER; POLLUTION; CONTROL; ECONOMICS;
IJC-LW-VOL. 1; GCODE1A; GCODE1B; GCODE1C1; GCODE1D; GCODE1F; GCODE1G3; GCODE1H; GCODE1K2; GCODE1K4; GCODE1M2; GCODE1P4; GCODE1N2; GCODE2; GCODE3; GCODE3A; GCODE3B3; GCODE3B6; GCODE3C; GCODE3E2; GCODE3F1; GCODE3F2; GCODE3F4; GCODE4A; GCODE4B; GCODE4C; GCODE4F1; GCODE4F2; GCODE4E4; GCODE4G2; GCODE4G3; GCODE4G5; GCODE4G4; GCODE5A4; GCODE5B2; GCODE5B4;
GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D4; GCODE5D5;

332 LOREFICE, GEORGE J.; MUNAWAR, MOHIUDDIN;
THE ABUNDANCE OF DIATOMS IN THE SOUTHWESTERN NEARSHORE REGION OF LAKE ONTARIO DURING THE SPRING THERMAL BAR PERIOD;
(1974) PROCEEDINGS OF THE SEVENTEENTH CONFERENCE ON GREAT LAKES RESEARCH. PP. 619-628.;
ANALYSIS; BIOMASS; THERMAL BAR; CYANOPHYTA; PYRROPHYTA; BACILLARIOPHYCEAE;

CHRYSOPHYTA; CRYPTOPHYTA; CHLOROPHYTA; DINOPHYCEAE; PHYTOPLANKTON; METHODS; TEMPERATURE; VAN DORN WATER BOTTLE;
5282; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;
AS PART OF THE IFYGL PROGRAM AN INTENSIVE STUDY WAS CARRIED OUT DURING APRIL AND MAY 1976 IN THE NEARSHORE REGION OF LAKE ONTARIO. WATER SAMPLES WERE COLLECTED FROM 45 STATIONS ON THE SOUTHWESTERN NEARSHORE AREA OF LAKE ONTARIO AT 1/2, 4 AND 8 KMS. USING THE UTERMOHL TECHNIQUE, PHYTOPLANKTON WAS ANALYZED QUALITATIVELY AND QUANTITATIVELY. DURING THE INVESTIGATION PERIOD THE THERMAL BAR REMAINED WITHIN THE STUDY AREA. IN APRIL IT STAYED SHOREWARD OF THE 4 KMS STATIONS, DIPPING INTO AND OUT OF THE SHORE. BY MAY IT HAD ADVANCED FARTHER OUT BUT IN MOST CASES TO LESS THAN 8 KMS. TOTAL PHYTOPLANKTON BIOMASS ALONG WITH DIATOMS, PARTICULARLY MELOSIRA BINDERANA KUTZ. SHOWED HIGH CONCENTRATIONS ON THE NEARSHORE SIDE OF THE THERMAL BAR. THIS OBSERVATION MAY BE RELATED TO TEMPERATURE AND THE CONCENTRATION OF NUTRIENTS IN THE NEARSHORE REGION. DIATOMS ACCOUNTED FOR 56% OF THE BIOMASS IN APRIL AND 46% IN MAY. DURING APRIL SURIRELLA ANGUSTATA KUTZ., RHODOMONAS MINUTA SKUJA AND PERIDINIUM ACICULIFERUM (LEMM.) LEMM. WERE THE MOST COMMON SPECIES WHILE M. BINDERANA KUTZ., P. ACICULIFERUM AND MELOSIRA ISLANDICA SSP. HELVETICA O. MULLER WERE COMMON IN MAY.;

333 LORENZEN, CARL J.;
NATIONAL SCIENCE FOUNDATION FUNDED RESEARCH IN THE GREAT LAKES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP266-269;
RESEARCH; NATIONAL SCIENCE FOUNDATION; US;
US-FCS-P1972; GCODE6;

334 LOVETT, RAYMOND J.; GUTENMANN, WALTER H.; PAKKALA, IRENE S.; YOUNGS, WILLIAM D.; LISK, DONALD J.; BURDICK, GEORGE E.; HARRIS, EARL J.;
A SURVEY OF THE TOTAL CADMIUM CONTENT OF 406 FISH FROM 49 NEW YORK STATE FRESH WATERS;
(   ) JOURNAL OF FISHERIES RESEARCH BOARD OF CANADA. VOL. 29. NO.19. PP 1283-1290 OC 1972;
CADMIUM; FISH; NY; ADIRONDACKS; ACCUMULATION; METHODS; ESOX; SALVELINUS; SALMO; MICROPTERUS; ICTALURUS; STIZOSTEDION VITREUM; PERCA; AMBLOPLITES RUPESTRIS; APLODINOTUS GRUNNIENS; DOROSOMA CEPEDIANUM; CATOSTOMUS; POMOXIS NIGROMACULATUS; CYPRINUS; ONCORHYNCHUS;
3376; GCODE4; GCODE5;
FISH FROM NEW YORK STATE FRESH WATERS WERE SURVEYED FOR TOTAL CADMIUM. THE MAJORITY OF SAMPLES CONTAINED 20PPB. FISH FROM ADIRONDACK WATERS CONTAINED CADMIUM ABOVE 20PPB MOST CONSISTENTLY. FISHES FROM CENTRAL NEW YORK WATERS RARELY CONTAINED CADMIUM GREATER THAN 20 PPB. THE REMAINDER SHOWED CONCENTRATIONS UP TO 100 PPB WITH ONLY A FEW ABOVE THIS CONCENTRATION. THESE HIGHER CONCENTRATIONS MAY BE RELATED TO GENERALLY HIGHER BACKGROUND CADMIUM LEVELS IN THIS ADIRONDACK AREA WHERE MANY METALLIC ORE DEPOSITS ARE LOCATED WITH WHICH CADMIUM IS TYPICALLY ASSOCIATED. CADMIUM ACCUMULATION ONLY OCCASIONALLY APPEARED SPECIES-DEPENDENT. NO RELATION WAS OBVIOUS BETWEEN TOTAL RESIDUES OF THE METAL AND SIZE OR SEX OF FISH OR AGE OF LAKE TROUT. THE CADMIUM CONCENTRATIONS OBSERVED ARE COMPARABLE TO THOSE COMMONLY PRESENT IN MANY OTHER FOODS.;

335 LUDWIG, JAMES P.;
HERRING AND RING-BILLED GULL POPULATIONS OF THE GREAT LAKES 1960-1965;
(1966) U OF MI GREAT LAKES RES DIVISION PROC 9TH CONF GREAT LAKES RES, P80-89;
AVES; POPULATION DYNAMICS; LARIDAE; FOOD ACQUISITION; REPRODUCTION;
IGR-09-1966; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE GULL POPULATIONS OF THE GREAT LAKES HAVE INCREASED ENORMOUSLY IN THE LAST DECADE. DURING THIS 6-YR SURVEY, 1960-1965, HERRING GULLS (LARUS ARGENTATUS) INCREASED FROM 24,000 TO 43,000 BREEDING PAIRS IN LAKES HURON AND MICHIGAN, AND RING-BILLED GULLS (LARUS DELAWARENSIS) INCREASED FROM 27,000 TO 99,000 BREEDING PAIRS. APPARENTLY HERRING GULLS OF LAKES HURON AND MICHIGAN HAVE PRODUCED THE BIRDS WHICH ARE NESTING THERE ON THEIR OWN, BUT RING-BILLED GULLS HAVE, IN ADDITION TO RAISING MORE GULLS IN THE LAKES HURON AND MICHIGAN COLONIES, RECRUITED MANY ADULT GULLS FROM LAKE ONTARIO. THE LAKE ONTARIO RING-BILL POPULATION EXCEEDS 100,000 BREEDING PAIRS. BOTH OF THESE POPULATIONS FIT MODELS WHICH HAVE A 10 OR 12% ANNUAL ADULT MORTALITY AND 60 TO 70% LOSS OF FLEDGLINGS

PRIOR TO FIRST BREEDING. SIMILAR POPULATION GROWTH WAS NOTED IN THE CASPIAN TERN (HYDROPROGNE CASPIA). ALEWIVES (ALOSA PSEUDOHARENGUS) MADE UP 50 TO 65% OF THESE BIRDS' DIETS WHILE RESIDENT ON LAKES HURON AND MICHIGAN. APPARENTLY THIS NEW FOOD RESOURCE HAS PROVIDED THE GULLS WITH MORE FOOD WHEN NEEDED TO RAISE YOUNG AND THUS UNDERPINNED THESE POPULATIONS' GROWTH. FACTORS THREATENING THESE GROWING GULL POPULATIONS INCLUDE A SHORTAGE OF NESTING SPACE, PESTICIDES IN THE FOOD CHAIN (PARTICULARLY IN LAKE MICHIGAN), AND BOTULISM. INCREASING GULL POPULATIONS SEEM TO BE PROVIDING, WITH NO INCREASE IN DEATH RATE, MANY MORE GULL CARCASSES ON THE BEACHES. CLEARLY, THE GULL DIEOFFS ARE MUCH MORE COMPLEX THAN OWING TO A SINGLE CAUSE, BOTULISM. AS YET, THESE DIEOFFS, HAVE HAD LITTLE EFFECT ON THE POPULATIONS;

336 LYMAN, EVELYN; COLEMAN, BABETTE B;
SOME ASPECTS OF THE ECOLOGY OF ORLEANS COUNTY, NEW YORK;
(1971) PROC ROCHESTER ACADEMY OF SCIENCE, 12(2):160-232;
BRYOPHYTA; PHYSIOGRAPHY; PLANTS; VEGETATION; DISTRIBUTION;
RAS-12-2; GCODE5B4;

337 MACCLENNAN, PAUL;
SAME OLD CROSSFIRE IN BATTLE OF THE ICE BOOM;
(1979) THE BUFFALO NEWS, MARCH 25, 1979, PP ;
ICE; ICE CONTROL; IJC; PUBLIC PARTICIPATION;
7904; GCODE4G5; GCODE5A4T3;

338 MACDONALD, H. BARRIE;
REPORT ON IFYGL INTERCOMPARISON STUDY;
(1972) IFYGL B NO 4, PP16-26;
IFYGL; METHODS; CANADA; MEASUREMENT; IFY-64;
GCODE5;

339 MACMULLAN, RALPH;
GREAT LAKES RECREATION;
(1966) MI NATURAL RESOURCES COUNCIL, 11TH ANNUAL CONFERENCE. PP34-39;
LAKES; RECREATION; LAND USE;
MI-NRC-C11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

340 MARK, HERMAN; GEDNEY, RICHARD T.;
NASA GREAT LAKES REGIONAL EARTH OBSERVATION PROGRAM;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP225-245;
NASA; US; REGULATORY AGENCY; REMOTE SENSING; ICE; CURRENTS; PROGRAMS;
US-FCS-P1972; GCODE6; GCODE7;

341 MARKELLO, SAMUEL J.;
PLANKTONIC ROTIFERA AND CRUSTACEA OF THE LAKE ONTARIO INSHORE REGION;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP191-206;
ZOOPLANKTON; ROTIFERA; CRUSTACEA; POPULATION DYNAMICS; SPECIES DIVERSITY;
BIOMASS;
US-EPA-660/3-73-021; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D5;

342 MARLER, RAYMOND L;
SUMMARY REPORT;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 14P;
COASTAL ZONE; PHYSIOGRAPHY; GEOMORPHOLOGY; SOIL; RUNOFF DRAINAGE; VEGETATION; RECREATION; HISTORY; MAN; ENGINEERING; AESTHETICS; MAPS; WATER SUPPLY; LAND USE;
SLE-STE; GCODE5D4; GCODE5D5; GCODE7;
DURING THE SUMMER OF 1972 THE STATE UNIVERSITY OF NEW YORK STATE COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY CONDUCTED A STUDY OF THE NATURAL RESOURCES IN A 1 MILE SHORELINE STRIP EXTENDING THE ENTIRE REACH OF THE ST LAWRENCE AND EASTERN LAKE ONTARIO CONTAINED IN ST LAWRENCE AND JEFFERSON COUNTIES.

THE PURPOSE OF THE STUDY WAS TO PROVIDE NATURAL RESOURCE DATA AND INFORMATION. 7 TECHNICAL REPORTS WITH MAPS AND A SUMMARY REPORT ARE INCLUDED IN ORDER TO PRESENT DETAILED DATA AND INFORMATION FOR THE ST LAWRENCE-EASTERN ONTARIO AREA AS IT APPLIES TO

PHYSIOGRAPHY; GEOLOGY AND SOILS; WATER; NATURAL VEGETATION; WILDLIFE; FISHERIES; AND RECREATION. USING THE RESOURCE DATA GATHERED DEVELOPMENTAL SUITABILITY WAS ALSO INVESTIGATED WITH SPECIAL REFERENCE TO ENVIRONMENTAL IMPACT. THE REPORT POINTS OUT THE VALUE OF THE NATURAL RESOURCES TO THE AREA AND, FURTHERMORE, PROVIDES A PRODUCTIVITY RATING FOR FISHERIES AND WILDLIFE HABITAT AND NATURAL VEGETATION. A SUMMARY MAP SYNTHESIZING AVAILABLE NATURAL RESOURCES INFORMATION WAS PREPARED AND REPRESENTS A SHORELINE PLANNING GUIDE FOR THE ST LAWRENCE-EASTERN ONTARIO AREA;

343 MARSHALL, JACK S.; WALLER, BARBARA J.; YAGUCHI, ELSA M.;
PLUTONIUM IN THE LAURENTIAN GREAT LAKES: FOOD-CHAIN RELATIONSHIPS;
(1975) INTERNAT ASSOC OF THEORETICAL AND APPLIED LIMNOLOGY PROC CONGRESS IN CANADA V 19, PP323-326;
PLUTONIUM; FOOD WEBS; FISH; ACCUMULATION; BIOACCUMULATION; PHYTOPLANKTON; ZOOPLANKTON; BENTHOS;
ITL-C-1974-P1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

344 MARSHALL, K ERIC;
A BIBLIOGRAPHY OF THE LAKE TROUT, SALVELINUS NAMAYCUSH (WALBAUM), 1970-77;
(1978) CAN FISHERIES AND MARINE SERVICE TECHNICAL REPORT (799, 110;
BIBLIOGRAPHY; FISH; SALVELINUS NAMAYCUSH;
CAN-FE-FMS-TR799; GCODE6;
THIS BIBLIOGRAPHY CONSISTS OF REFERENCES LISTED IN ALPHABETICAL ORDER BY AUTHOR. A SUBJECT INDEX IS PROVIDED. SOME NEW PUBLICATIONS DESCRIBING THE FRESHWATER FISHES OF AREAS IN NORTH AMERICA ARE ALSO LISTED;

345 MAXWELL, GEORGE R., II; SMITH, GERALD A.;
BIRDS OF THE ST. LAWRENCE RIVER;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCEANDS FORESTRY, PP141-165;
AVES; COMMUNITY STRUCTURE; SPECIES DIVERSITY;
NY-US-FF-SL; GCODE7;

346 MAXWELL, GEORGE R.; SMITH, GERALD A.; KOTA, PATRICIA A.; CARROLAN, THOMAS L.;
PRELIMINARY BIRD AND ASSOCIATED VEGETATIONAL STUDIES FOR NAVIGATION SEASON EXTENSION ON THE ST. LAWRENCE RIVER;
(1976) NY SUNY OSWEGO RICE CREEK BIOLOGICAL FIELD STATION BULLETIN V. 3, 126P;
AVES; PLANTS; MIGRATION; REPRODUCTION; HABITAT;
NY-UOS-B1976; GCODE5; GCODE7;

347 MCCARTY, JAMES; JAWORSKI, NORBERT A.;
ANCILLARY RESEARCH ACTIVITIES OF EPA;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP95-102;
EPA; US; REGULATORY AGENCY; RESEARCH; PROGRAMS;
US-FCS-P1972; GCODE6,
THE US EPA CONDUCTS RESEARCH THROUGH ITS 4 NATIONAL ENVIRONMENTAL RESEARCH CENTERS AND THEIR ASSOCIATED LABORATORIES IN 4 GENERAL AREAS: (1) ECOLOGY, (2) POLLUTION CONTROL TECHNOLOGY, (3) HEALTH EFFECTS, AND (4) MONITORING. THE MAJOR EMPHASIS OF THIS PAPER WILL BE ON THE ECOLOGICAL RESEARCH PROGRAM. BUDGET AND STAFF RESOURCES FOR THE GREAT LAKES PORTION ARE PRORATED FROM TOTAL EFFORT.;

348 MCCRIMMON, HUGH R.;
THE REINTRODUCTION OF ATLANTIC SALMON INTO TRIBUTARY STREAMS OF LAKE ONTARIO;
(1948) TRANSACTIONS AMERICAN FISHERIES SOCIETY. VOL. 76. PP126-132;
SALMO SALAR; FISH STOCKING; INTRODUCTIONS; SURVIVAL; RIVERS; FISH;
258C; GCODE5;
EXPERIMENTAL PLANTINGS OF ATLANTIC SALMON (SALMO SALAR) FRY WERE MADE IN DUFFIN CREEK, ONTARIO COUNTY, EACH YEAR FROM 1944 TO 1946. FROM 1945 TO 1947 A LARGE PART OF THE CREEK WAS PLANTED UNIFORMLY AT A DENSITY OF ONE FRY PER YARD, REGARDLESS OF LOCAL STREAM CONDITIONS. EACH OF THESE UNIFORM PLANTINGS WAS FOLLOWED BY A STUDY OF THE SURVIVAL AND DISTRIBUTION OF THE SALMON DURING LIFE IN THE CREEK. POPULATIONS WERE ESTIMATED BY THE USE OF A ONE-MAN HAND SEINE. EACH OF THE THREE UNIFORM PLANTINGS RESULTED IN THE SAME PATTERN OF SURVIVAL OVER THE STREAM SYSTEM AND SHOWED THE COMPARATIVE SUITABILITY OF VARIOUS STREAM

TYPES FOR REARING SALMON. UNSEDIMENTED GRAVELLY RIFFLES WERE FOUND TO BE NECESSARY FOR A HIGH SURVIVAL OF NEWLY PLANTED FRY. SUBSEQUENT SURVIVAL TO THE SMOLT STAGE IN AREAS NOT CHARACTERIZED BY LETHAL SUMMER TEMPERATURES WAS LARGELY DEPENDENT ON SUITABLE HABITATS TO ACCOMMODATE THE FISH AS THEY BECOME LARGER. CAPTURE OF SMOLTS DURING THE SPRING OF 1946 SHOWED THAT AT LEAST 2 PERCENT OF THE FRY PLANTED IN 1946 REACHED LAKE ONTARIO IN 1948. FROM THE STUDY OF THE SURVIVAL OF SALMON IT MUST BE CONCLUDED THAT A NUMBER OF SECTIONS OF DUFFIN CREEK ARE SUITABLE FOR THE REARING OF SALMON TO THE SMOLT STAGE. THE FATE OF THE SALMON REACHING LAKE ONTARIO HAS YET TO BE DETERMINED.;

349 MCFADDEN, JAMES T.; ARMSTRONG, JOHN M.;
A MULTIDISCIPLINARY UNIVERSITY PROGRAM IN MARINE SCIENCES AND ENGINEERING FOR THE GREAT LAKES;
(1970) PROC. 13TH CONF. GREAT LAKES RES. 25PP;
EDUCATION; ENGINEERING;
1932; GCODE6;

350 MCNAUGHT, DONALD C.; BUZZARD, MARLENE;
CHANGES IN ZOOPLANKTON POPULATIONS IN LAKE ONTARIO (1939-1972);
(1973) PROC 16TH CONF GREAT LAKES RES, P76-86;
ZOOPLANKTON; CYCLOPS; BOSMINA; ABUNDANCE; COASTAL ZONE; CRUSTACEA; CLADOCERA; CALANOIDA; CYCLOPOIDA; MATHEMATICAL MODELS;
IGR-C16-1973; GCODE5;
SINCE 1966 THE CRUSTACEAN LIMNOPLANKTON OF LAKE ONTARIO HAS BEEN DOMINATED IN JULY BY CYCLOPS BICUSPIDATUS AND BOSMINA LONGIROSTRIS. APPARENTLY IN 1939 DAPHNIA SPP. AND DIAPTOMUS SPP. WERE RELATIVELY MORE ABUNDANT AT THE SAME TIME. GENERALLY SUMMER STANDING CROPS OF ZOOPLANKTON IN THE INSHORE WATERS (<50 M) DO NOT SHOW SIGNIFICANT INCREASE FROM 1939 TO 1972 AT THE SAME TIME, THE COMPOSITION OF THESE COMMUNITIES HAS SHIFTED FROM DOMINANCE BY THE CYCLOPOIDS AND CALANOIDS (61%) TO THE CLADOCERANS (46-64%). CONCOMITANTLY, NUMEROUS NEW SPECIES HAVE BEEN RECORDED, THE MOST RECENT BEING DIAPTOMUS ASHLANDI IN 1972. TWO ADDITIONAL TRENDS ARE EVIDENT SINCE 1966. THE SPECIES DIVERSITY HAS INCREASED IN THE INSHORE WATERS FROM 1.77 TO 2.96, DUE TO INCREASES IN THE EVENNESS COMPONENT. AT THE SAME TIME, THEIR THEORETICAL CARRYING CAPACITY FOR ZOOPLANKTON HAS ALSO INCREASED;

351 MCNAUGHT, DONALD C.; BUZZARD, MARLENE;
ZOOPLANKTON PRODUCTION IN LAKE ONTARIO AS INFLUENCED BY ENVIRONMENTAL PERTURBATIONS;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS ECOLOGICAL RESEARCH SERIES, PP29-51;
ZOOPLANKTON; PROGRAMS; WATER QUALITY; IFYGL; PRIMARY PRODUCTIVITY; POPULATION DYNAMICS; SPECIES DIVERSITY; DEPTH; ABUNDANCE; COMMUNITY STRUCTURE;
US-EPA-660/3-73-021; GCODES;

352 MCNAUGHT, DONALD C.; FENLON, MARK W.;
THE EFFECTS OF THERMAL EFFLUENTS UPON SECONDARY PRODUCTION;
(1972) VERH INTERNAT VEREIN LIMNOL 18(1):204-212;
ALGAE; PHYTOPLANKTON; ZOOPLANKTON; THERMAL; EFFLUENTS; DISCHARGE FLOW; FOOD WEBS; PRIMARY PRODUCTIVITY; TEMPERATURE;
ITL-C1971-P2; GCODESC3;

353 MCNAUGHT, DONALD C.; GIOVANNANGELO, DANIEL;
PLANKTONIC CRUSTACEA OF THE LAKE ONTARIO INSHORE REGION;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP207-216;
CRUSTACEA; ZOOPLANKTON; SPECIES DIVERSITY; POPULATION DYNAMICS; COMMUNITY STRUCTURE; MATHEMATICAL MODELS;
GCODESC2; GCODESL3; GCODESC5; GCODESD5; US-EPA-660/3-73-021;

354 MEGERIAN, EDMOND; PENTLAND, RALPH L.;
SIMULATION OF GREAT LAKES BASIN WATER SUPPLIES;
(1968) CORPS OF ENGINEERS. MISCELLANEOUS PAPER 68-2. REPRINTED FROM WATER RESOURCES RESEARCH. VOL. 4, NO. 1. PP. 11-17;
WATER SUPPLY; MATHEMATICAL MODELS; SIMULATION;

US-CE-L-MF66-2; GCODE6;
THE BASIC CONCEPT UTILIZED IN THE SIMULATION STUDY IS TO EVALUATE STATISTICALLY THE RECORDED SUPPLIES TO ISOLATE THE TWO COMPONENTS ASSUMED TO CONSTITUTE THE BASIN WATER SUPPLY: (1) THAT PORTION OF THE SUPPLY THAT IS CONSIDERED RANDOM, OWING TO CHANCE INTERACTION OF UNPREDICTABLE METEOROLOGICAL ELEMENTS, AND (2) THAT PORTION OF THE SUPPLY THAT IS THE RESULT OF THE PERSISTENCE DUE TO NATURAL STORAGE IN THE LAKES, SOIL, BEDROCK, AND SNOW OVER THE DRAINAGE BASIN. IN THIS STUDY, CONSIDERATION WAS ALSO GIVEN TO THE RELATIONSHIP BETWEEN SUPPLIES IN NEIGHBORING BASINS. THESE FACTORS WERE USED TO FORMULATE MATHEMATICAL MODELS FOR SIMULATION OF SUPPLIES TO ALL OF THE GREAT LAKES SIMULTANEOUSLY. EXTENSIVE STATISTICAL TESTS HAVE BEEN USED TO ENSURE THAT THE STATISTICAL PARAMETERS AND THE TIME SERIES CHARACTERISTICS OF THE SIMULATED DATA RESEMBLE THOSE OF THE RECORDED DATA;

355 MEREDITH, DALE D.;
MODELING OF THE GREAT LAKES WATER SYSTEM;
(1969) 5TH ANNUAL AMERICAN WATER RESOURCES CONFERENCE. 16PP;
MATHEMATICAL MODELS; HYDROLOGY;
1767; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

356 MEREDITH, DALE D.; EWING, BEN B.;
SYSTEMS APPROACH TO THE EVALUATION OF BENEFITS FROM IMPROVED GREAT LAKES WATER QUALITY;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP843-870;
WATER QUALITY; RECREATION; COMMERCIAL FISHERIES; WATER SUPPLY; MATHEMATICAL MODELS;
1766; GCODE6;
A SYSTEMS APPROACH TO THE EVALUATION OF BENEFITS THAT WOULD ACCRUE DUE TO AN IMPROVEMENT IN THE QUALITY OF THE WATER IN THE GREAT LAKES IS OUTLINED. THE BASIC APPROACH FOR ANALYSIS OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY, RECREATIONAL USE, AND COMMERCIAL FISHING INVOLVES FOLLOWING A CHANGE IN WATER QUALITY THROUGH A SEQUENCE OF INTERRELATIONSHIPS TO ARRIVE AT AN ESTIMATE OF ANNUAL BENEFITS. THE DIFFICULTIES ENCOUNTERED IN DETERMINING THE BENEFITS ARE DISCUSSED. A MATHEMATICAL MODEL WHICH CAN BE SOLVED TO DETERMINE THE BENEFITS FOR A CHANGE IN WATER QUALITY WHEN THE LEVEL OF WATER QUALITY BEFORE AND AFTER THE IMPROVEMENT IS KNOWN IS PRESENTED IN THE APPENDIX. THE MODEL IS APPLICABLE TO ALL USES;

357 MEYERS, CALDWELL D.;
THE ROLE OF THE FEDERAL GOVERNMENT IN ENVIRONMENTAL IMPACT;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP12-15;
ENVIRONMENT; IMPACT, REGULATORY AGENCY; US;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

358 MILDNER, WILLIAM F.;
ASSESSMENT OF EROSION AND SEDIMENTATION IN THE U. S. PORTION OF THE GREAT LAKES BASIN;
(1974) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF THE GREAT LAKES VOLUME I, 66PP;
EROSION; SEDIMENTATION; ACCUMULATION; MEASUREMENT;
IJC-LP-VOL. 1; GCODE1A; GCODE1B1; GCODE1B; GCODE1C1; GCODE1C2; GCODE1D3; GCODE1D4; GCODE1F; GCODE1G3; GCODE1H; GCODE1K2; GCODE1K4; GCODE1M2; GCODE1M4; GCODE1N2; GCODE2; GCODE3A, GCODE3B3; GCODE3B6; GCODE3C; GCODE3E2; GCODE3F1; GCODE3F2; GCODE4A; GCODE4B; GCODE4D; GCODE4F1; GCODE4F2; GCODE4E4; GCODE4G2; GCODE4G3; GCODE4G4; GCODE4G5; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D4; GCODE5C5; GCODE6;

359 MILLS, EDWARD L.; FORNEY, JOHN L.;
PRIMARY AND SECONDARY PRODUCTION IN THE ST. LAWRENCE RIVER SYSTEM;
(1977) IN: GEIS, JAMES W., ED, PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP1-29;
PRIMARY PRODUCTIVITY; SECONDARY PRODUCTIVITY; PHYTOPLANKTON; PERIPHYTON; MACROPHYTES; ZOOPLANKTON; BENTHOS; AQUATIC INVERTEBRATES; WATER QUALITY; SPECIES DIVERSITY;

NY-US-PA-SL; GCODE7;

360 MITCHELL, HAROLD D.; ANDRLE, ROBERT F.;
BIRDS OF THE NIAGARA FRONTIER REGION SUPPLEMENT;
(1970) BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN VOL 22, SUPPLEMENT, 10P;
AVES; MIGRATION; DISTRIBUTION; ABUNDANCE; HABITAT;
BUF-BSNS-BULL-22S; GCODE46; GCODE5A2; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;

361 MONROE COUNTY DEPARTMENT OF PLANNING;
MONROE COUNTY COASTAL ZONE MANAGEMENT PROGRAM PHASE II;
(1977) MONROE COUNTY DEPARTMENT OF PLANNING, 907;
LAND USE; DEVELOPMENT PLANNING; PUBLIC PARTICIPATION; COASTAL ZONE; HISTORY;
MAN; FLOODS; RECREATION; WATER QUALITY;
MC-P; GCODE5C2;
UNDER THE COASTAL ZONE MANAGEMENT ACT AS AMENDED, THIS DOCUMENT WAS PREPARED FOR THE NEW YORK DEPARTMENT OF STATE. THIS DOCUMENT IS THE PHASE II REPORT OF THE MONROE COUNTY COASTAL ZONE MANAGEMENT PROGRAM. THE REPORT INCLUDES RECOMMENDED COASTAL BOUNDARIES, PUBLIC PARTICIPATION REPORT, HISTORY OF THE COASTAL TOWNS, INVENTORIES, NOMINATION OF GAPCS, AREAS OF LAND AND WATER USE CONFLICTS, PRIORITY OF PERMISSIBLE USES IN RESOURCE AREAS AND GAPCS, GOALS AND POLICIES AND RECOMMENDATIONS FOR THE COASTAL ZONE OF MONROE COUNTY;

362 MONTEITH, TIMOTHY J.; SONZOGNI, WILLIAM C.;
U. S. GREAT LAKES SHORELINE EROSION LOADING;
( ) IJC PLUARG, PP211;
SHORE; EROSION; COASTAL ZONE; NUTRIENTS; NUTRIENT LOADING; HEAVY METALS;
PHYSICAL CHARACTERISTICS; ANALYSIS; WATER QUALITY; CALCULATIONS;
CHEMICAL LOADING;
IJC-LL; GCODE1A1; GCODE1A8; GCODE1D2; GCODE1D3; GCODE1D4; GCODE1F; GCODE1G3;
GCODE1H; GCODE1K2; GCODE1K4; GCODE1M2; GCODE1M4; GCODE1N2; GCODE2; GCODE3A;
GCODE3B2; GCODE3B3; GCODE3C; GCODE3D4; GCODE3E2; GCODE3F1; GCODE3F2; GCODE3F3;
GCODE3F4; GCODE4A; GCODE4B; GCODE4D; GCODE4F; GCODE4E2; GCODE4G2; GCODE4G3;
GCODE4G4; GCODE4G5; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C8; GCODE5D3;
GCODE5D4; GCODE5D5; GCODE6;

363 MOORE, EMMELINE;
INTRODUCTION;
(1929) NY STATE CONSERVATION DEPARTMENT. A BIOLOGICAL SURVEY OF THE ERIE-NIAGARA SYSTEM. PP9-11;
FISH; FISHERIES;
NY-C1; GCODE4; GCODE46; GCODE4E3; GCODE5A4I3;

364 MOORE, RICHARD B.;
A NEAR-SHORE SURVEY OF EASTERN LAKE ONTARIO PART I;
( ) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP172-180;
CHEMISTRY; BIOLOGY; NUTRIENT LOADING; ZOOPLANKTON; PHYTOPLANKTON; BENTHOS;
SPECIES DIVERSITY; ABUNDANCE; CLADOCERA; ALGAE; CHLOROPHYTA; PBC; ACCUMULATION;
PESTICIDES; CHLORINATED HYDROCARBON PESTICIDES;
US-EPA-660/3-73-021; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D5; GCODE5D3T4;
GCODE5D4T1;

365 MORTON, FRED I.;
EVAPORATION FROM LARGE DEEP LAKES;
(1967) WATER RESOURCES RESEARCH. VOL. 3. NO. 1. PP181-200;
LAKES; EVAPORATION; HYDROLOGY; HEAT BUDGET; ENERGY; RADIATION; SOLAR RADIATION;
1967; GCODE1; GCODE5;
DERIVED INSOLATION AND WATER BUDGET EVAPORATION DATA FOR LAKE SUPERIOR AND LAKE ONTARIO ARE ANALYZED IN TERMS OF BOTH THE REGIONAL AND THE WATER SURFACE ENERGY BALANCES. THE RESULTS INDICATE THAT THE SEASONAL PATTERN OF EVAPORATION IS GOVERNED BY HEAT STORAGE CHANGES, AND THAT THESE CHANGES ARE CLOSELY ASSOCIATED WITH ATMOSPHERIC ENERGY EXPORT FROM THE LAKE. THIS FINDING PROVIDES A PHYSICAL BASIS FOR THE SIMPLE EMPIRICAL RELATIONSHIPS BETWEEN MONTHLY EVAPORATION AND ISLAND TO MAINLAND TEMPERATURE DIFFERENTIALS THAT ARE DEVELOPED FROM THE WATER BUDGET EVAPORATION DATA. SUBSTANTIAL ATMOSPHERIC ENERGY EXPORT, A CONCOMITANT OF

HEAT STORAGE CHANGES, REDUCES THE ENERGY AVAILABLE FOR EVAPORATION. THEREFORE, EVAPORATION FROM A LARGE DEEP LAKE IS LESS THAN THAT FROM A LARGE SHALLOW LAKE UNDER COMPARABLE CLIMATIC CONDITIONS. THE ANALYSIS ALSO PROVIDES SPECULATIVE REASONING AND EVIDENCE TO INDICATE THAT EVAPORATION FROM A LARGE DEEP LAKE IS CLOSELY RELATED TO THE RADIANT HEAT TRANSFER TO THE SKY;

366 MOYER, CARL;
MAKE UP OF THE GREAT LAKES;
(1966) MI NATURAL RESOURCES COUNCIL, 11TH ANNUAL CONFERENCE. PP6-14;
LAKES; GEOLOGY; PHYSIOGRAPHY; DISSOLVED SOLIDS; TURBIDITY; SILICA; IRON; CALCIUM; MAGNESIUM; SODIUM; POTASSIUM; CARBONATE; BICARBONATE; SULFATES; NITRATE; CHLORIDES; CHEMICAL OXYGEN DEMAND; TOTAL SOLIDS; BIOCHEMICAL OXYGEN DEMAND;
MI-NRC-C11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

367 MOZLEY, SAMUEL C.;
BENTHIC COMMUNITY RESPONSES TO ENERGY-RELATED EFFLUENTS IN THE GREAT LAKES;
(1975) PROC 2ND FED CONF ON THE GREAT LAKES, PP436-447;
BENTHOS; POPULATION DYNAMICS; COMMUNITY STRUCTURE;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

368 MOZLEY, SAMUEL C.;
THE POTENTIAL FOR MAPPING BOTTOM FAUNA IN THE GREAT LAKES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P147-160;
MAPPING; BENTHOS; CHIRONOMIDAE;
IJC-RA7; GCODE1; GCODE5;

369 MUENSCHER, WALTER C.;
VEGETATION OF THE NIAGARA RIVER AND THE EASTERN END OF LAKE ERIE;
(1929) NY STATE CONSERVATION DEPARTMENT. A BIOLOGICAL SURVEY OF THE ERIE-NIAGARA SYSTEM. PP189-197;
CLADOPHORA; POTAMOGETON; ALGAE; PHYTOPLANKTON; PLANTS;
GCODE4; GCODE4E3; GCODE4G; GCODE5A4T3; NY-C1;

370 MULL, MARTIN W.;
GREAT LAKES ENVIRONMENTAL MONITORING AND PREDICTION SERVICES OF THE NATIONAL WEATHER SERVICE;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP192-196;
MONITORING; METEOROLOGY; CLIMATIC FACTORS; FORECASTING; REMOTE SENSING;
US-FCS-P1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

371 MULVANEY, J. NEIL;
CANADIAN POLLUTION CONTROL LAW - THE GREAT LAKES;
(1977) BONNER, PATRICIA A., ED., ECONOMIC AND LEGAL ENFORCEMENT MECHANISMS, PROC. OF A WORKSHOP HELD IN WINDSOR, ONTARIO, FEB. 21-22, 1977. PP273-278;
POLLUTION; WATER; REGULATION ; LEGISLATION;
IJC-RA-F-77-01; GCODE0; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5;

372 MUNAWAR, MOHIUDDIN; MUNAWAR, IFTEKHAR F.;
SOME OBSERVATIONS ON THE GROWTH OF DIATOMS IN LAKE ONTARIO WITH EMPHASIS ON MELOSIRA BINDERANA KUTZ DURING THERMAL BAR CONDITIONS;
(1975) ARCH. HYDROBIOL. VOL. 75. NO. 4. PP490-499;
BACILLARIOPHYCEAE; MELOSIRA; ALGAE; GROWTH; TEMPERATURE; PHOSPHORUS; SILICATES; ABUNDANCE; NUTRIENTS; PRIMARY PRODUCTIVITY; PHYTOPLANKTON; CYANOPHYTA; CHLOROPHYLL A; BIOMASS; CHLOROPHYTA;
1043; GCODE5;
THE DISTRIBUTION OF THE DIATOM MELOSIRA BINDERANA KUTZ, A SPECIES OFTEN ASSOCIATED WITH EUTROPHICATION, WAS INVESTIGATED IN LAKE ONTARIO DURING 1970 AND 1972 IN RELATION TO TEMPERATURE STRUCTURE, SOLUBLE REACTIVE PHOSPHORUS AND SILICATE DURING SPRING WHEN A DISTINCT THERMAL BAR WAS FORMED. MELOSIRA BINDERANA SHOWED A MARKED NEARSHORE TO OFFSHORE DECREASING GRADIENT AND MAXIMUM DENSITIES WERE OBSERVED INSIDE THE THERMAL BAR. ITS ABUNDANCE WAS RELATED TO NUTRIENTS AND INDIRECTLY TO TEMPERATURE WHICH CONTROLLED THE CIRCULATION.

EXCESSIVE GROWTH OF M. BINDERANA DEPLETED SILICATE TO EXTREMELY LOW LEVELS IN THE NEARSHORE REGION;

373 MURPHY, ROSEANNE;
REGIONAL RECREATION FACILITIES INVENTORY;
(1975) BLACK RIVER-ST. LAWRENCE REGIONAL PLANNING BOARD TECHNICAL SERIES REPORT NUMBER 9, 54P;
RECREATION; FACILITIES; MANAGEMENT;
BSRP-T9; GCODE5D4; GCODE5D5; GCODE7;
THIS REPORT INVENTORIES OUTDOOR RECREATION FACILITIES IN THE BLACK RIVER-ST. LAWRENCE REGION. DATA WAS MANIPULATED FROM THE NEW YORK STATE OFFICE OF PARKS AND RECREATION "NEW YORK STATE OUTDOOR RECREATION FACILITIES INVENTORY" (UNDATED) AND THE JEFFERSON COUNTY DEPARTMENT OF PLANNING. "OUTDOOR RECREATION FACILITIES INVENTORY", 1973. INCORPORATED INTO THIS REPORT ARE SUMMARIES OF CERTAIN ELEMENTS ESSENTIAL TO OUTDOOR RECREATION IN THIS REGION INCLUDING OUTSTANDING NATURAL RESOURCES, LAND, CLIMATE, WATER, SOILS AND POPULATION;

374 MURTHY, C. RAJ;
DISPERSION OF FLOATABLES IN LAKE CURRENTS;
(1974) IFYGL B NO 11, PP23-27 (IFYGL PROJECT 89WM);
CURRENTS; MEASUREMENT; DISPERSAL; CIRCULATION;
IFY-JU;

375 MURTHY, C. RAJ; KULLENBERG, G.; WESTERBERG, H.; MINERS, KEN C.;
LARGE SCALE DIFFUSION STUDIES;
(1974) IFYGL B NO 10, PP22-49 (IFYGL PROJECT 89WM);
DIFFUSION; TURBULENCE; EPILIMNION; MESOLIMNION ; HYPOLIMNION; MATHEMATICAL MODELS;
IFY-BIC; GCODE5;

376 MURTHY, C. RAJ; MINERS, KEN C.;
NEARSHORE DIFFUSION STUDIES;
(1977) IFYGL B NO 21, PP99-112 (IFYGL PROJECT 89WM);
DIFFUSION; TURBULENCE; MONITORING; METHODS; EQUIPMENT; DYE PATTERNS;
IFY-B21; GCODE5;

377 MYER, GLENN E.;
LAKE ONTARIO ATLAS: SURFACE WAVES;
(1977) NY SEA GRANT INSTITUTE NYSSGP-OA-77-004, 107P;
WAVES; LAKE LEVELS; SEICHES; MATHEMATICAL MODELS;
US-CN-NY-OA-77-004; GCODE5;
THE SURFACE WAVES MONOGRAPH PROVIDES AN ANALYSIS OF GRAVITY WAVES, SEICHE, WIND TIDES, AND LONG-TERM VARIATIONS IN LAKE LEVEL. A COMPUTERIZED ANALYSIS DETAILS THE DYNAMICS OF EACH EFFECT. SPECIFIC STORM EFFECTS ARE ANALYZED AND AN EXAMPLE OF HINDCASTING OF WIND VELOCITY V. WAVE HEIGHT IS EXPLAINED. THIS MONOGRAPH WILL BE USEFUL FOR LIMNOLOGY, LAND USE PLANNING, SHORE EROSION ANALYSIS, AND COASTAL MANAGEMENT;

378 NALEPA, THOMAS F.; THOMAS, NELSON A.;
DISTRIBUTION OF MACROBENTHIC SPECIES IN LAKE ONTARIO IN RELATION TO SOURCES OF POLLUTION AND SEDIMENT PARAMETERS;
(1976) JOURNAL OF GREAT LAKES RESEARCH, VOL. 2, NO. 1, PP. 150-163;
PHOSPHORUS; CARBON; NITROGEN; TOTAL CARBON; TOTAL NITROGEN; KJELDAHL NITROGEN; OLIGOCHAETA; AMPHIPODA; PONTOPOREIA; LIMNODRILUS; TUBIFEX; STYLODRILUS; POLLUTION; SEDIMENT; BENTHOS; PARTICLE SIZE; TOPOGRAPHY; POTAMOTHRIX; CHIRONOMIDAE; PELECYPODA; GASTROPODA; TROPHIC LEVEL; DISTRIBUTION;
GCODE5; 4742;
BOTTOM SAMPLES WERE COLLECTED IN LAKE ONTARIO DURING THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES (IFYGL) IN NOVEMBER 1972. SAMPLES WERE COLLECTED IN TRIPLICATE AT 55 STATIONS LOCATED THROUGHOUT THE LAKE. SAND PREVAILED AT THE SHALLOW AREAS BUT SILT DOMINATED THE INTERMEDIATE AND DEEP-WATER AREAS. TOTAL CARBON AND TOTAL KJELDAHL NITROGEN CONTENT OF THE SEDIMENT INCREASED WITH INCREASED DEPTH, BUT NO TREND WAS EVIDENT IN THE TOTAL PHOSPHORUS CONTENT. OLIGOCHAETES AND THE AMPHIPOD PONTOPOREIA AFFINIS ACCOUNTED FOR 92% OF ALL

ORGANISMS COLLECTED. THE FORMER GROUP DOMINATED THE SHALLOW AREAS WHILE THE LATTER DOMINATED THE INTERMEDIATE AND DEEP-WATER ZONES. STYLODRILUS HERINGIANUS AND LIMNODRILUS HOFFMEISTERI WERE THE MOST WIDELY DISTRIBUTED SPECIES, BEING COLLECTED AT 51 OF THE 55 STATIONS. SEVERAL APPROACHES WERE USED TO EVALUATE TROPHIC CONDITIONS IN THE LAKE - THE INDICATOR SPECIES APPROACH, THE OLIGOCHAETE-DENSITY INDEX, A MODIFIED "GOODNIGHT-WHITLEY" INDEX, AND THE BRINKHURST % L. HOFFMEISTERI INDEX. THE INDICATOR SPECIES APPROACH PROVED TO BE THE MOST SENSITIVE INDEX BECAUSE INCONSISTENCIES AROSE WHEN OTHER INDICES WERE APPLIED. THE MOST OBVIOUSLY EUTROPHIC AREAS WERE NEAR THE MOUTH OF THE NIAGARA RIVER AND OFF TORONTO. THESE AREAS WERE CHARACTERIZED BY HIGH OLIGOCHAETE DENSITIES DOMINATED BY EITHER L. HOFFMEISTERI OR T. TUBIFEX. MESOTROPHIC CONDITIONS WERE EVIDENT ALONG THE SOUTHERN SHORELINE FROM THE MOUTH OF THE NIAGARA RIVER TO ROCHESTER, NEW YORK. STYLODRILUS HERINGIANUS, L. HOFFMEISTERI, T. TUBIFEX, AND P. AFFINIS WERE SIGNIFICANTLY RELATED TO SOME OF THE MEASURED SEDIMENT PARAMETERS IN EITHER THE INTERMEDIATE OR DEEP-WATER AREAS.;

379 NALEWAJKO, CZESLAWA;
PHYTOPLANKTON DISTRIBUTION IN LAKE ONTARIO;
(1967) INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH. PROC CONF ON GREAT LAKES RESEARCH. PP63-69.;
ALGAE; CHRYSOPHYTA; PHYTOPLANKTON; STEPHANODISCUS; MELOSIRA; ASTERIONELLA; DISTRIBUTION;
6629; GOODES;
IN APRIL 1965 THE PHYTOPLANKTON OF LAKE ONTARIO WITHIN APPROXIMATELY SIX MILES OF THE SHORE DIFFERED QUANTITATIVELY AND ALSO IN SPECIES COMPOSITION FROM MORE CENTRAL AREAS OF THE LAKE. IN GENERAL, ALGAE WERE TWO OR THREE TIMES AS ABUNDANT CLOSE TO SHORE WITH STEPHANODISCUS TENUIS MOST. ACCOUNTING FOR 18-51% OF TOTAL NUMBERS, FARTHER OUT IN THE LAKE STEPHANODISCUS ACCOUNTED FOR ONLY 1.8 TO 10% OF THE TOTAL NUMBERS OF ALGAE AND MELOSIRA ISLANDICA O. MULL AND ASTERIONELLA FORMOSA HASS WERE THE MOST PROMINENT SPECIES. STEPHANODISCUS INCREASES RAPIDLY IN THE SPRING, AND THE DEVELOPMENT OF THE THERMAL BAR CONFINES IT TO THE WARMER COASTAL ZONE. GRADUALLY AS THE THERMAL BAR MOVES AWAY FROM THE SHORE STEPHANODISCUS SPREADS TO MORE CENTRAL AREAS OF THE LAKE; HOWEVER IT NEVER REACHES COMPARABLE NUMBERS THERE. SINCE THE THERMAL BAR HAS BEEN REPORTED TO IMPEDE RUNOFF, THE ABUNDANCE OF STEPHANODISCUS MAY BE ATTRIBUTED TO THE HIGHER NUTRIENT CONCENTRATIONS IN THE COASTAL ZONE. THE DISTRIBUTION OF MELOSIRA ISLANDICA WITH HIGHEST NUMBERS IN THE ISOTHERMAL COLD WATERS ON THE OFFSHORE SIDE OF THE THERMAL BAR AND LOW NUMBERS ON THE INSHORE SIDE CAN BE EXPLAINED BY THE INCREASED RATE OF SINKING OF THE DIATOM DUE TO THE DECREASED TURBULENCE ON THE ESTABLISHMENT OF THERMAL STRATIFICATION.;

380 NALEWAJKO, CZESLAWA; MARIN, LEO;
EXTRACELLULAR PRODUCTION IN RELATION TO GROWTH OF FOUR PLANKTONIC ALGAE AND OF PHYTOPLANKTON POPULATIONS FROM LAKE ONTARIO;
(1969) CAN J BOTANY, 47:3, P405-413;
PHYTOPLANKTON; ALGAE; CHLORELLA; ASTERIONELLA; MELOSIRA; STEPHANODISCUS; GROWTH; CULTURING; PHYSIOLOGY;
1500; GOODES;
IN 4 SPECIES OF PLANKTONIC ALGAE BOTH CARBON FIXATION AND EXCRETION ON AN ASH-FREE DRY WEIGHT BASIS INCREASE WITH RELATIVE GROWTH RATE (K) OF THE CULTURE MEASURED IN LOG 10 UNITS. IN NATURAL POPULATIONS PERCENTAGE EXCRETION VALUES ARE POSITIVELY CORRELATED WITH K VALUES; HOWEVER, ENVIRONMENTAL FACTORS MAY BE OF RELATIVELY GREATER IMPORTANCE AND DETERMINE THE EXTENT OF EXCRETION;

381 NATIONAL TRUST FOR HISTORIC PRESERVATION;
MEMBER ORGANIZATIONS AND THEIR HISTORIC PROPERTIES;
(1976) NATIONAL TRUST FOR HISTORIC PRESERVATION;
HISTORY; PROPERTIES; MAP; DIRECTORY; US;
BUTLER;

382 NEIL, JOHN H.; OWEN, GLENN E.;
DISTRIBUTION, ENVIRONMENTAL REQUIREMENTS AND SIGNIFICANCE OF CLADOPHORA IN THE GREAT LAKES;
(1964) U OF MI GREAT LAKES RES DIVISION PROC 7TH CONF GREAT LAKES RES, P113-121;

CLADOPHORA; PRIMARY PRODUCTIVITY; ALGAE; DISTRIBUTION; GROWTH; HABITAT; NUTRIENT UPTAKE; PHOSPHORUS; CONTROL;
IGR-C7-1964; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
EXCESSIVE GROWTHS OF CLADOPHORA SP. ALONG CERTAIN SECTIONS OF THE GREAT LAKES SHORELINE CREATE SERIOUS NUISANCE CONDITIONS WHICH AFFECT THE USE OF WATER FOR RECREATIONAL, INDUSTRIAL AND MUNICIPAL PURPOSES. INFORMATION ON THE ECOLOGY OF THIS ALGAE WAS COLLECTED AS PART OF A STUDY DIRECTED TOWARDS THE DEVELOPMENT OF CONTROL MEASURES. THE PRESENCE OF CLADOPHORA SP. IS DEPENDENT ON A SUITABLE SUBSTRATE FOR ATTACHMENT, WATER MOVEMENT, ADEQUATE LIGHT, AND NUTRIENTS IN EXCESS OF THOSE NORMALLY AVAILABLE IN THE WATERS OF THE UPPER GREAT LAKES. LAKES ONTARIO AND ERIE HAVE SUFFICIENT INHERENT FERTILITY TO SUPPORT MARGINAL GROWTHS, BUT WHERE LOCAL NUTRIENT SOURCES ARE AVAILABLE, PRODUCTION INCREASES. PHOSPHORUS APPLIED TO A LOCATION PROVIDING SUITABLE PHYSICAL CONDITIONS BUT DEVOID OF CLADOPHORA SP. RESULTED IN THE ESTABLISHMENT OF A SIZABLE AREA OF GROWTH. THE RESULTS OF ATTEMPTS AT CONTROL ARE ALSO DISCUSSED;

383 NELSON, GAYLORD;
AMERICA'S GREAT LAKES PROGRAM: THE BUREAUCRATIC MESS IN THE U.S.;
(1977) BONNER, PATRICIA A., ED., ECONOMIC AND LEGAL ENFORCEMENT MECHANISMS, PROC. OF A WORKSHOP HELD IN WINDSOR, ONTARIO, FEB.21-22, 1977. PP137-146;
WATER QUALITY; POLLUTION; PCB; LEGISLATION; PHOSPHORUS; ECONOMICS;
IJC-RA-P-77-01; GCODE6; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5;

384 NY CONSERVATION DEPT;
A BIOLOGICAL SURVEY OF THE LAKE ONTARIO WATERSHED;
(1940) NY CONSERVATION DEPT SUPPLEMENTAL TO 29TH ANNUAL REPORT,1939, 261P + 11 MAPS;
FISHERIES; FISH STOCKING; FISH; PLANTS; CHEMICAL COMPOSITION; DISEASES; PARASITES;
NY-C4; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D5;

385 NY CONSERVATION DEPT;
A BIOLOGICAL SURVEY OF THE OSWEGATCHIE AND BLACK RIVER SYSTEMS;
(1932) NY CONSERVATION DEPT SUPPLEMENTAL TO 21ST ANNUAL REPORT, PP269;
BIOLOGY; PHYTOPLANKTON; ZOOPLANKTON; FISH; ABUNDANCE; PREDATION; PARASITES; CHEMICAL COMPOSITION; LAKES; RIVERS;
NY-C3; GCODE5D411; GCODE7;

386 NY CONSERVATION DEPT;
A BIOLOGICAL SURVEY OF THE ST LAWRENCE WATERSHED;
(1931) STATE OF NY CONSERVATION DEPT BIOLOGICAL SURVEY (1930) NO. V, SUPPLEMENTAL TO 20TH ANNUAL REPORT, 261P, 13 MAPS;
FISH STOCKING; PREDATION; VEGATATION; CLADOCERA; COPEPODA; ROTIFERA; PROTOZOA; ALGAE; BACILLARIOPHYCEAE; CHEMICAL COMPOSITION; BENTHOS; CYPRINUS; PARASITES;
NY-C2; GCODE7;

387 NY DEPT OF ENVIRONMENTAL CONSERVATION;
ENVIRONMENTAL DATA GATHERING AND IMPACT ASSESSMENT STUDIES TO PRECEDE WINTER NAVIGATION DEMONSTRATION ON THE ST. LAWRENCE RIVER. OPINION OF THE STATE OF NEW YORK;
(1978) NY DEPT OF ENVIRONMENTAL CONSERVATION, 45P;
NAVIGATION SEASON EXTENSION; ENVIRONMENT; IMPACT; RESEARCH;
NY-E11; GCODE7;

388 NY STATE DEPT OF ENVIRONMENTAL CONSERVATION;
TRAFFIC IN ENDANGERED SPECIES OF FISH AND WILDLIFE;
(1978) NY STATE DEPT OF ENVIRONMENTAL CONSERVATION;
WILDLIFE; FISH; NY; ENDANGERED SPECIES;
8086;

389 NY DEPT OF HEALTH WATER POLLUTION CONTROL BOARD;
EIGHTEENMILE CREEK DRAINAGE BASIN;
(   ) NY DEPT OF HEALTH LAKE ONTARIO DRAINAGE BASIN
MUNICIPAL SEWAGE TREATMENT

INDUSTRIAL SEWAGE TREATMENT; COLOR; TURBIDITY; TEMPERATURE; PH; CARBON DIOXIDE; DISSOLVED OXYGEN; BIOCHEMICAL OXYGEN DEMAND; CHLORIDE; ALKALINITY; COLIFORMS; HARDNESS;
NY-HE-DBS-OR3; GCODE5B212; GCODE5B215; GCODE5B214; GCODE5B211; GCODE5A4T3S16;

390 NY DEPT OF HEALTH WATER POLLUTION CONTROL BOARD;
LAKE ONTARIO SURFACE WATERS INCLUDING SPECIFIED TRIBUTARIES;
(1958) NY DEPT OF HEALTH. LAKE ONTARIO DRAINAGE BASIN SURVEY SERIES REPORT NO. 4, 447P;
HYDROLOGY; LAND USE; COLIFORMS; WATER; COLOR; TURBIDITY; TEMPERATURE; PH; DISSOLVED OXYGEN; BIOCHEMICAL OXYGEN DEMAND; HARDNESS; CHLORIDE; ALKALINITY; MAPS; INDUSTRIAL SEWAGE TREATMENT; MUNICIPAL SEWAGE TREATMENT; CARBON DIOXIDE;
NY-HE-DBS-OR4; GCODE5;

391 NY DEPT OF HEALTH WATER POLLUTION CONTROL BOARD;
UPPER GENESEE RIVER DRAINAGE BASIN;
(1961) NY DEPT OF HEALTH, GENESEE RIVER DRAINAGE BASIN SURVEY SERIES REPORT NO. 2, 219P;
HYDROLOGY; LAND USE; WATER; COLOR; TURBIDITY; TEMPERATURE; PH; CARBON DIOXIDE; DISSOLVED OXYGEN; BIOCHEMICAL OXYGEN DEMAND; HARDNESS; CHLORIDE; ALKALINITY; COLIFORMS; MAPS;
NY-HE-DBS-GR2; GCODE5C215;

392 NY DEPT OF STATE;
NEW YORK STATE COASTAL MANAGEMENT PROGRAM APPENDIX TO DRAFT REPORT;
(1979) NY DEPT OF STATE, VOL 2, 430P, MAP;
MAPS; LEGISLATION; BIBLIOGRAPHY; HARBORS; WETLANDS; MANAGEMENT; COASTAL ZONE; LAND USE;
NY-ST-CZ-2; M7; GCODE4G; GCODE5; GCODE5A4T3; GCODE7;

393 NY DEPT OF STATE;
NEW YORK STATE COASTAL MANAGEMENT PROGRAM 1979 DRAFT REPORT WITH DRAFT ENVIRONMENTAL IMPACT STATEMENT;
(1979) NY DEPT OF STATE, VOL 1, 244P, MAP;
COASTAL ZONE; MANAGEMENT; PUBLIC PARTICIPATION; EROSION; FLOODS; AESTHETICS; RECREATION; ENERGY; WATER QUALITY; FISH; WILDLIFE;
NY-ST-CZ-1; M7; GCODE4G; GCODE5; GCODE5A4T3; GCODE7;

394 NY DEPT OF STATE COASTAL MANAGEMENT PROGRAM;
SUMMARY OF NEW YORK'S COASTAL MANAGEMENT PROGRAM;
(1979) NY DEPT OF STATE, 40 X 30 IN;
COASTAL ZONE; NY; MAPS; RECREATION; WATER QUALITY; EROSION;
M7; GCODE4G; GCODE5;

395 NY SEA GRANT PROGRAM;
ENVIRONMENTAL POLLUTANT DISTRIBUTION IN LAKE ERIE AND LAKE ONTARIO ECOSYSTEMS;
(1972) US DEPT OF COMMERCE NOAA NY STATE SEA GRANT PROGRAM PROJECT 015-8101-A, 44P;
FISH; OSMERUS; COTTIDAE; COPPER; MERCURY; CADMIUM; ZINC; ARSENIC; SELENIUM;
US-CS-NY-61; GCODE5;

396 NY STATE ELECTRIC AND GAS CORPORATION;
NEW HAVEN - NUCLEAR (ENVIRONMENTAL REPORT);
(   ) NY STATE ELECTRIC AND GAS CORPORATION, VARIOUS PAGING;
INSECTA; AVES; MAMMALIA; PHYTOPLANKTON; HABITAT; ALGAE; ZOOPLANKTON; BIOMASS; BENTHOS; FISH; SPAWNING; HYDROLOGY; BATHYMETRY; WATER QUALITY; SEDIMENT; CHEMICAL COMPOSITION; BACTERIA;
GCODE5D5; GCODE5D511; GCODE5D512;

397 NOE, CHRISTOPHER D.;
ENVIRONMENTAL DATA AND INFORMATION;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP189-191;
DATA PROCESSING;
US-FCS-P1972; GCODE6;

NOAA OPERATES NATIONAL CENTERS FOR ARCHIVING, RETRIEVING AND DISSEMINATING ENVIRONMENTAL DATA IN THE ATMOSPHERIC, MARINE AND SOLID EARTH DISCIPLINES. WITHIN NOAA'S OVERALL MISSION, THIS RESPONSIBILITY RESTS WITH THE ENVIRONMENTAL DATA SERVICE (EDS). PRESENT EFFORTS IN THE GREAT LAKES INCLUDE PREPARING AN INVENTORY OF AVAILABLE HISTORICAL ENVIRONMENTAL DATA IN THE GREAT LAKES, ARCHIVING A COMPLETE SET OF IFYGL DATA, AND CREATING THE GREAT LAKES DATA CENTER (GLDC). THE GLDC WILL BE LOCATED IN THE LAKES AREA AND WILL PROVIDE ACCESS TO BOTH HISTORICAL AND CONTEMPORARY DATA FILES FOR USE BY FEDERAL AGENCIES, INDUSTRY, PRIVATE RESEARCH ORGANIZATIONS AND THE GENERAL PUBLIC.;

398 NORSTROM, ROSS J.; HALLETT, DOUGLAS J.; SONSTEGARD, RONALD A.;
COHO SALMON (ONCORHYNCHUS KISUTCH) AND HERRING GULLS (LARUS ARGENTATUS) AS INDICATORS OF ORGANOCHLORINE CONTAMINATION IN LAKE ONTARIO;
(1978) J FISHERIES RES BD CANADA 35(11):1401-1409;
ALOSA PSEUDOHARENGUS; HCB; BIOACCUMULATION; ONCORHYNCHUS; LARIDAE; PCB; DDE; MIREX; CHLORINATED HYDROCARBON PESTICIDES; DIELDRIN; FOOD; OSMERUS;
5804; GCODE5;
COHO SALMON AND HERRING GULLS IN THE GREAT LAKES RELY TO A LARGE EXTENT ON ALEWIVES AND SMELT FOR THEIR FOOD. ALL OF THESE SPECIES RANGE WIDELY IN THE LAKES, AND THEREFORE PROVIDE AN INTEGRATED MEASURE OF LEVELS OF ORGANOCHLORINE CONTAMINANTS IN THE LAKES. ORGANOCHLORINE RESIDUES WERE DETERMINED IN HERRING GULL EGGS FROM FOUR EASTERN LAKE ONTARIO COLONIES, COHO SALMON FROM WESTERN LAKE ONTARIO, AND POOLED ALEWIFE AND SMELT FROM THE STOMACH CONTENTS OF THE SALMON. THE MEAN APPARENT BIOCONCENTRATION FACTOR WAS 2.9 +/- 0.7 FOR ACCUMULATION OF PCBS, DDE, MIREX, AND PHOTO MIREX IN HERRING GULL EGGS. PCBS WITH FEWER THAN 6 CHLORINES, HCB, DIELDRIN, AND DDD WERE CONCENTRATED TO A LESSER EXTENT IN HERRING GULL EGGS. ASSUMING AN APPARENT BIOCONCENTRATION FACTOR FROM WATER OF 5 X 100,000 FOR ACCUMULATION OF PCBS, DDE, MIREX, AND PHOTOMIREX IN SMELT AND ALEWIVES, THE CORRESPONDING VALUES IN COHO SALMON AND HERRING GULL EGGS WERE 1.5 X 1,000,000 AND 2.5 X 10,000,000.;

399 NORTON, DAVID C.;
LAKE ONTARIO BASIN: OVERLAND PRECIPITATION, 1972-73;
(1975) US DEPT OF COMMERCE NOAA TECHNICAL MEMORANDUM ERL GLERL-1, PP12;
PRECIPITATION; MEASUREMENT; MATHEMATICAL MODELS; US;
US-CN-TM-ERL-GLERL-1; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C3; GCODE5C5; GCODE5D2; GCODE5D3; GCODE5D5;
DAILY PRECIPITATION VALUES WERE DERIVED FOR THE US PORTION OF THE LAKE ONTARIO LAND BASIN FOR 1972 AND 1973. THE DAILY PRECIPITATION VALUES WERE GENERATED USING A THIESSEN POLYGON PROCEDURE AND NATIONAL WEATHER SERVICE STATION DATA. ISOHYETAL MAPS ARE PROVIDED FOR 1972 AND 1973.;

400 NRIAGU, JEROME O.;
DISSOLVED SILICA IN PORE WATERS OF LAKES ONTARIO, ERIE, AND SUPERIOR SEDIMENTS;
(1978) LIMNOLOGY AND OCEANOGRAPHY 23(1):53-67;
SILICA; SEDIMENT; CHEMICAL COMPOSITION;
7708; GCODE1; GCODE4; GCODE5;
THE DISTRIBUTION OF DISSOLVED SILICA IN PORE WATERS FROM LAKES ONTARIO, ERIE, AND SUPERIOR SEDIMENTS IS NOT DIRECTLY RELATED TO THE DEPOSITION OF DIATOMITES FROM THE OVERLYING WATER. IT IS PROPOSED THAT SILICA CONCENTRATIONS IN THE PORE WATERS ARE CONTROLLED BY DISSOLUTION OF FERRIALUMINUM SILICATE. THE CRYPTOCRYSTALLINE COMPLEX IS FORMED IN THE SEDIMENTS BY THE REACTION OF BIOGENIC SILICA WITH ALUMINUM AND FERRIC OXYHYDROXIDES OR BY THE HYDROLYSIS OF CLAY MINERALS. A MASSIVE EPISODIC FLUX OF BIOGENIC SILICA TO THE SEDIMENTS FOLLOWS THE CRASH OF DIATOM BLOOMS. MOST OF THE BIOGENIC SILICA IS HOWEVER DISSOLVED IN THE WATER COLUMN OR AT THE SEDIMENT-WATER INTERFACE; A SMALL FRACTION IS FIXED PERMANENTLY IN THE SEDIMENTS AS THE CRYPTOCRYSTALLINE COMPLEX. BUDGET CALCULATIONS SHOW THAT REGENERATION OF SILICA FROM ONTARIO AND ERIE SEDIMENTS FAR EXCEEDS ANNUAL INPUTS FROM EXTERNAL SOURCES.;

401 NRAIGU, JEROME O.; COKER, ROBERT D.;
EMMISSION OF SULFUR FROM LAKE ONTARIO SEDIMENTS;
(1976) LIMNOL AND OCEAN 21(4):485-489;
SEDIMENT; SULFUR;

GCODE5;
CALCULATIONS INDICATE THAT ABOUT 600,000 KG OF SULFUR IS RELEASED ANNUALLY FROM LAKE ONTARIO SEDIMENTS. THIS CONSTITUTES ABOUT 1% OF THE ANNUAL SULFUR INPUT INTO THE SEDIMENTS AND IS SIGNIFICANT COMPARED TO THE TOTAL SULFUR THAT CYCLES ANNUALLY THROUGH THE LAKE. THE SULFUR RELEASED FROM THE SEDIMENTS IS ENRICHED IN 32S WITH THE RESULT THAT THE SULFUR IN THE HISTORICAL LAYERS IS CHARACTERIZED BY HIGH VALUES.;

402 O'CONNOR, DONALD J.; MUELLER, JOHN A.;
A WATER QUALITY MODEL OF CHLORIDES IN GREAT LAKES;
(1970) J. SANITARY ENGINEERING DIVISION. ASCE. VOL. 96. NO. SA4. PROC. PAPER 7470. PP955-975;
CHLORIDES; FORECASTING; MATHEMATICAL MODELS; ENGINEERING; WATER; POLLUTION; WATER QUALITY;
2162; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE INCREASE IN THE CONCENTRATION OF CONSERVATIVE SUBSTANCES IN THE GREAT LAKES IS DESCRIBED BY A SIMPLE TIME VARIABLE EQUATION. THE CONCENTRATION OF CHLORIDES IS RELATED TO THE FRESH WATER FLOW, THE VOLUMES OF THE LAKES AND THE VARIOUS SOURCES - MUNICIPAL, INDUSTRIAL, NATURAL BACKGROUND AND ROAD DE-ICING. THE INCREASE IN CONCENTRATION SINCE 1900 IS PRESENTED AND PROJECTIONS ARE MADE OF ANTICIPATED CONCENTRATIONS BASED ON VARIOUS ASSUMPTIONS OF CONTROL;

403 O'CONNOR, DONALD J.; THOMANN, ROBERT V.; DI TORO, DOMINIC M.;
PHYTOPLANKTON MODELS AND EUTROPHICATION PROBLEMS;
(1974) NOAA RESOURCES FOR THE FUTURE SYMP ON ECOLOGICAL MODELING, PP149-209;
PHYTOPLANKTON; EUTROPHICATION; MODEL STUDIES; MATHEMATICAL MODELS; ANALYSIS; DISTRIBUTION; SAN JOAQUIN RIVER; CA; POTOMAC RIVER; NUTRIENTS; TRANSPORT; ZOOPLANKTON; NITROGEN; PHOSPHORUS; NUTRIENT LOADING; SEDIMENTATION; BIOCHEMISTRY; WATER QUALITY; GROWTH; VA; MD; RIVERS;
7040; GCODE4A; GCODE4B; GCODE5;
A SET OF EQUATIONS DESCRIBING THE SEASONAL DISTRIBUTION OF PHYTOPLANKTON IS APPLIED TO THE ANALYSIS OF EUTROPHICATION PROBLEMS IN VARIOUS US LOCATIONS. THE THEORETICAL STRUCTURE OF THE ANALYSIS IS REVIEWED WITH A QUALITIVE DESCRIPTION OF THE PERTINENT EQUATIONS AND A DISCUSSION OF THE GENERAL PROCEDURE OF THE VERIFICATION PROCESS. EXAMPLES FROM THE FRESHWATER SEGMENT OF THE SAN JOAQUIN RIVER, CALIF.; THE ESTUARINE REGIONS OF THE SACRAMENTO-SAN JOAQUIN DELTA, CALIF; THE POTOMAC RIVER, WASHINGTON, D.C; WESTERN LAKE ERIE, AND LAKE ONTARIO ARE PRESENTED.;

404 OGAWA, ROANN E.;
LAKE ONTARIO PHYTOPLANKTON, SEPTEMBER 1964; GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 14: LIMNOLOGICAL STUDY OF LAKE ONTARIO, 1964. PP 27-38.;

PHYTOPLANKTON; ALGAE; CHLOROPHYTA; BACILLARIOPHYCEAE; MYXOPHYCEAE; DINOPHYCEAE; CHRYSOPHYTA;
GLF-TR14; GCODE5;
PHYTOPLANKTON COUNTS ON SAMPLES COLLECTED IN LAKE ONTARIO ON SEPTEMBER 6-18, 1964, SHOWED THAT GREEN ALGAE WERE THE DOMINANT PLANKTERS AND DIATOMS WERE OF SECONDARY IMPORTANCE. THE GREATEST ABUNDANCE OF PHYTOPLANKTON WAS CLOSE TO SHORE FROM TORONTO, ALONG THE SOUTHERN SHORE OF THE LAKE, AND UP THE EASTERN SHORE TO THE NORTH CHANNEL. THE OPEN WATERS OF LAKE ONTARIO WERE CHARACTERIZED BY LOW NUMBERS OF PHYTOPLANKTON. THE RELATIONSHIPS AMONG PHYTOPLANKTON ABUNDANCE, BOTTOM FAUNA DISTRIBUTION, AND ENRICHMENT ARE DISCUSSED.;

405 OKUN, DANIEL A.;
MANAGING THE GREAT LAKES WATER RESOURCE;
(1969) J. WATER POLLUTION CONTROL FEDERATION. VOL. 41. NO.11. PART 1. PP1859-1862;
WATER; RESOURCES; MANAGEMENT; WATER QUALITY;
1904; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

406 OLDS, NICHOLAS V.;
GREAT LAKES WATER LEVELS;
(1966) MI NATURAL RESOURCES COUNCIL, 11TH ANNUAL CONFERENCE. PP26-33;

WATER LEVELS; LAKES; ECONOMICS; NAVIGATION; HARBORS; RECREATION; LEGISLATION;
MI-NRC-C11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

407 ONGLEY, EDWIN D.;
IMPACT OF PHOSPHORUS CONTROL ON RIVER SYSTEMS IN SOUTHERN ONTARIO;
(1978) IJC-PLUARG CANADIAN TASK D, PP16;
PHOSPHORUS; PHOSPHORUS LOADING; CONTROL; RIVERS; CANADA;
IJC-L-PLUARG-D-C-2; GCODE3G; GCODE5J; GCODE3K; GCODE4; GCODE5;

408 ONGLEY, EDWIN D.;
LAND USE, WATER QUALITY AND RIVER-MOUTH LOADINGS: A REGIONAL PERSPECTIVE FOR ONTARIO;
(1978) IJC PLUARG CANADIAN TASK D, 13PP;
LAND USE; WATER QUALITY; PHOSPHORUS; PHOSPHORUS LOADING;
IJC-L-PLUARG-D-C-1; GCODE6;

409 ONGLEY, EDWIN D.;
SOURCE CONTRIBUTIONS TO RIVER-MOUTH PHOSPHORUS LOADS, SOUTHERN ONTARIO;
(1978) IJC PLUARG CANADIAN TASK D, PP9;
PHOSPHORUS; PHOSPHORUS LOADING; RIVERS;
IJC-L-PLUARG-D-C-3; GCODE4; GCODE5;

410 PACK, A. BOYD; DETHIER, BERNARD E.;
THE CLIMATE OF WESTERN NEW YORK;
( ) CORNELL UNIVERSITY. AGRONOMY MIMEO 69-12. 19PP;
PRECIPITATION; TEMPERATURE; AIR CURRENTS; METEOROLOGY; NY;
1580; GCODE4; GCODE5;

411 PAKKALA, IRENE S.; WHITE, MERRIE N.; BURDICK, GEORGE E.; HARRIS, EARL J.; LISK, DONALD J.;
RESIDUES IN FISH, WILDLIFE, AND ESTUARIES: A SURVEY OF THE LEAD CONTENT OF FISH FROM 49 NEW YORK STATE WATERS;
(1972) PESTICIDES MONITORING J. VOL. 5. NO. 4. PP348-355;
LEAD; FISH; NY; POMOXIS NIGROMACULATUS; AMIA CALVA; SALVELINUS FONTINALIS; ICTALURUS; SALMO TRUTTA; LOTA LOTA; CYPRINUS CARPIO; ESOX NIGER; COREGONUS; ONCORHYNCHUS; APLODINOTUS GRUNNIENS; DOROSOMA CEPEDIANUM; CARASSIUS AURATUS; SALVELINUS NAMAYCUSH; COREGONUS CLUPEAFORMIS; MICROPTERUS SALMOIDES; ESOX MASQUINONGY; ESOX; SALMO GAIRDNERI; AMBLOPLITES RUPESTRIS; MICROPTERUS DOLOMIEUI; MORONE SAXATILIS; ACIPENSERIDAE; STIZOSTEDION VITREUM; ROCCUS CHRYSOPS; CATOSTOMUS COMMERSONNI; PERCA;
2667; GCODE4; GCODE5;
AN ANALYTICAL SURVEY WAS MADE OF THE TOTAL LEAD CONTENT OF 419 FISH OF VARIOUS SPECIES SAMPLED IN 1969 FROM 49 NEW YORK STATE WATERS AND A GROUP OF LAKE TROUT SAMPLED IN 1970 FROM CAYUGA LAKE ONLY. MOST OFTEN, LEAD CONCENTRATIONS RANGED FROM 0.3 TO 1.5 PPM, BUT A FEW SAMPLES CONTAINED LEVELS UP TO 3 PPM. FISH FROM CERTAIN WATERS INCLUDING LAKES CANADICE, CANANDAIGUA, ERIE, HEMLOCK, PLEASANT, AND RAQUETTE AND THE HUDSON RIVER SHOWED HIGHER LEAD LEVELS MORE CONSISTENTLY THAN FISH FROM OTHER WATERS. NO CORRELATION WAS NOTED BETWEEN LEAD CONCENTRATION AND THE SIZE, SPECIES, OR SEX OF FISH, AND LEAD DID NOT APPEAR TO BE CUMULATIVE IN THE LAKE TROUT OF KNOWN AGE UP TO 12 YEARS FROM CAYUGA LAKE;

412 PARKER, CARL E.;
MERCURY - MAJOR NEW ENVIRONMENTAL PROBLEM;
(1970) NY STATE CONSERVATIONIST. INFORMATION LEAFLET L-186. 4PP;
MERCURY; POLLUTION; WATER; FISH; TOXICITY;
2471; GCODE3; GCODE4; GCODE5; GCODE6;

413 PARKES, WILLIAM G.; OLSON, THEODORE A.; ODLAUG, THERON O.;
WATER QUALITY STUDIES ON THE GREAT LAKES BASED ON CARBON FOURTEEN MEASUREMENTS ON PRIMARY PRODUCTIVITY;
(1969) UNIVERSITY OF MINNESOTA WATER RESOURCES RESEARCH CENTER;
WATER QUALITY; CARBON 14; MEASUREMENT; PRIMARY PRODUCTIVITY; METHODS; STATISTICS; SAMPLE COLLECTION;
PN-L65-B17; GCODE1; GCODE2; GCODE3; GCODE4; GCODE6;

414 PATALAS, KAZIMIERZ;
COMPOSITION AND HORIZONTAL DISTRIBUTION OF CRUSTACEAN PLANKTON IN LAKE ONTARIO;
(1969) J. FISHERIES RESEARCH BOARD OF CANADA. VOL. 26. NO. 8. PP2135-2164;
DISTRIBUTION; ZOOPLANKTON; CRUSTACEA; COPEPODA; CLADOCERA; POPULATION DYNAMICS;
ABUNDANCE;
1625; GCODE5;
THE HORIZONTAL DISTRIBUTION OF PLANKTONIC CRUSTACEANS WAS DETERMINED IN LAKE ONTARIO AT MONTHLY INTERVALS FROM JUNE TO OCTOBER 1967, BASED ON NET HAULS FROM 50 TO 0 M AT 32-62 STATIONS. A SEPARATE STUDY CONDUCTED OVER A 24-HR PERIOD AT ONE STATION SHOWED THAT ON THE AVERAGE 90% OF THE ZOOPLANKTERS OCCUPIED THE 0-50-M STRATUM THROUGH WHICH THE NET WAS HAULED. ELEVEN SPECIES OF COPEPODS AND 13 SPECIES OF CLADOCERANS WERE FOUND. THE MOST ABUNDANT FORMS WERE CYCLOPS BICUSPIDATUS THOMASI, DAPHNIA RETROCURVA, BOSMINA LONGIROSTRIS, BOSMINA COREGONI COREGONI, TROPOCYCLOPS PRASINUS MEXICANUS, AND CERIODAPHNIA LACUSTRIS. MOST SPECIES APPEARED IN THE COLLECTIONS DURING JUNE-JULY IN THE EASTERN PART OF THE LAKE WITH ABUNDANCE PATTERNS LATER MOVING WESTWARD, CONTRARY TO THE GENERAL MOVEMENT OF WIND AND WATER. AT THE TIME OF MAXIMAL POPULATION DENSITY THERE WAS A STRONG POSITIVE CORRELATION BETWEEN ZOOPLANKTON ABUNDANCE AND HEAT CONTENT OF THE WATER COLUMN FROM 0 TO 25 M. THE EASTERN PART OF THE LAKE AVERAGED 1.7 TIMES MORE SPECIMENS/CM2 THAN THE WESTERN PART OF THE LAKE. UPWELLING WAS RESPONSIBLE FOR LOW NUMBERS OF ZOOPLANKTERS ALONG THE NORTHWESTERN SHORE. ABUNDANCE PATTERNS SIMILAR TO GENERALIZED CURRENT FLOWS WERE OBSERVED IN THE NORTHERN AND SOUTHERN PARTS OF THE LAKE. FLOW FROM THE NIAGARA RIVER WAS ASSOCIATED WITH INCREASED ABUNDANCE OF ZOOPLANKTERS IN SPRING AND SUMMER, BUT DECREASED ABUNDANCE IN AUTUMN. A DETAILED STUDY OF THE ABUNDANCE AND DISTRIBUTION OF ZOOPLANKTON OFFSHORE FROM TORONTO HARBOUR SHOWED THAT HARBOUR WATER DOES INFLUENCE ZOOPLANKTONIC POPULATIONS IN THE VICINITY. TEMPERATURE AND DEPTH OF THE EPILIMNION AS INFLUENCED BY THE GENERAL DIRECTION OF WIND MOTION WERE KEY FACTORS IN UNDERSTANDING THE ZOOPLANKTONIC COMMUNITY OF LAKE ONTARIO;

415 PATALAS, KAZIMIERZ;
CRUSTACEAN PLANKTON AND THE EUTROPHICATION OF ST. LAWRENCE GREAT LAKES;
(1972) JOURNAL FISHERIES RESEARCH BOARD OF CANADA VOL. 29. PP.1451-1462.;
EUTROPHICATION; ARTHROPODA; DIAPTOMUS; CYCLOPOIDA; CLADOCERA; ABUNDANCE;
PHOSPHORUS LOADING; ZOOPLANKTON;
3334; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
FOURTEEN COPEPOD AND 13 CLADOCERAN SPECIES WERE FOUND IN THE SUMMER PLANKTON OF LAKES SUPERIOR, HURON, ERIE, AND ONTARIO. CYCLOPS BICUSPIDATUS THOMASI WAS THE MOST ABUNDANT SPECIES IN LAKES HURON, ONTARIO, AND ERIE, AND DIAPTOMUS SICILIS IN LAKE SUPERIOR. A GENERAL TREND WAS SEEN FROM OLIGOTROPHIC LAKE SUPERIOR TO EUTROPHIC LAKE ERIE: THE DIMINISHING SIGNIFICANCE OF CALANOIDS (DIAPTOMUS SICILIS AND DIAPTOMUS ASHLANDI) ACCOMPANIED BY THE INCREASING PREDOMINANCE OF CYCLOPOIDS AND CLADOCERANS (CYCLOPS BICUSPIDATUS THOMASI, MESO-CYCLOP EDAX, DAPHNIA RETROCURVA, DAPHNIA GALEATA MENDOTAE, BOSMINA LONGIROSTRIS, AND BOSMINA COREGONI COREGONI). THE AVERAGE CRUSTACEAN ABUNDANCE VARIED FROM 43 INDIVIDUALS/SQUARE CM IN LAKE SUPERIOR TO 400/SQUARE CM IN LAKE ERIE, AND WAS RELATED TO BOTH THE HEAT AND CHLOROPHYLL CONTENT OF THE WATER. TOTAL PHOSPHORUS LOADINGS FOR THE FIVE GREAT LAKES WERE CALCULATED USING VOLLENWEIDER'S CRITERIA BASED ON PHOSPHORUS EXPORTS FROM SOILS AND HUMAN POPULATION DENSITIES IN THE DRAINAGE BASINS. THEY AMOUNTED TO 0.05 G TOTAL P/SQUARE M YEAR FOR LAKE SUPERIOR, 0.13 FOR LAKE HURON, 0.29 FOR LAKE MICHIGAN, 0.66 FOR LAKE ONTARIO, AND 0.98 FOR LAKE ERIE. THE LAKE-AVERAGE SUMMER CHLOROPHYLL-A CONCENTRATIONS AS WELL AS SECCHI DISC VISIBILITIES WERE CLOSELY RELATED TO THE PHOSPHORUS LOADING RATES. CRUSTACEAN ABUNDANCE WAS THEN INDIRECTLY RELATED TO THE PHOSPHORUS LOADING RATES. BASED ON THE CORRELATIONS FOUND, PREDICTIONS WERE MADE ABOUT CHANGES IN SECCHI DISC VISIBILITY AND CHLOROPHYLL CONCENTRATION WITH INCREASING HUMAN POPULATION DENSITIES IN THE DRAINAGE BASIN.;

416 PEMBERTON, CARLYSLE;
ACTIVITIES OF THE REGIONAL OFFICES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP89-94;
US; REGULATORY AGENCY; EPA; PROGRAMS;
GCODE6; US-FCS-P1972;

3 EPA REGIONAL OFFICES CARRY OUT THE AGENCY PROGRAMS IN THE GREAT LAKES BASIN. ALL OF THE REGIONS CARRY POLICIES AND IMPLEMENT PROGRAMS WHICH HAVE NATIONAL APPLICATION. THE REGIONS ALSO CARRY OUT, INDIVIDUALLY OR COOPERATIVELY, PROGRAM ACTIVITIES WHICH HAVE SPECIFIC APPLICATION TO ONE OR MORE OF THE GREAT LAKES.;

417 PETERSON, STEVEN R.; ELLARSON, ROBERT S.;
P,P'-DDE, POLYCHLORINATED BIPHENYLS AND ENDRIN IN OLDSQUAWS IN NORTH AMERICA, 1969-73;
(1978) PESTICIDES MONITORING JOURNAL 11(4):170-181;
CLANGULA HYEMALIS AVES; CHLORINATED HYDROCARBON PESTICIDES; PESTICIDES; EGGS; ACCUMULATION; BIOACCUMULATION; PCB; ENDRIN; DDE; DDT; BIOLOGY; FOOD WEBS; HABITAT; BIOASSAY; MORPHOLOGY;
GCODE2; GCODE3; GCODE5; GCODE6;
THE ARCTIC-NESTING OLDSQUAW, CLANGULA HYEMALIS, WAS MONITORED FOR PESTICIDE BODY BURDENS. OLDSQUAWS WERE COLLECTED FROM WINTERING GROUNDS IN LAKE MICHIGAN, LAKE HURON, LAKE ONTARIO, AND MAINE, AND FROM BREEDING GROUNDS IN NORTHWESTERN HUDSON BAY. BODY BURDEN SHIFTS DUE TO CHANGES IN FOOD CONTAMINATION WERE INVESTIGATED, AND PESTICIDE TRANSFERRAL FROM WINTERING TO BREEDING ENVIRONMENTS WAS EXPLORED. DDE AND PCB LEVELS WERE COMPARATIVELY LOW IN THE OLDSQUAW'S FOOD SOURCE, THE INVERTEBRATE PONTOPOREIA AFFINIS. AVERAGE RESIDUES RANGED FROM 4-107 PPM PCB'S, 2-4 PPM DDE, AND N LS X 0.1-0.7 PPM ENDRIN IN CARCASSES COLLECTED AT LAKE , MICHIGAN. DDE CORRELATION WAS HIGH IN PAIRED OLDSQUAW'S AND IN FEMALES AND THEIR CLUTCHES. EGGSHELLS WERE 4.5% THINNER THAN SHELLS COLLECTED BEFORE 1947. EVIDENCE SUGGESTS THAT OLDSQUAWS MAY ELIMINATE DDE THROUGH THE EGG AND RETURN TO WINTERING AREAS WITH LOWER BODY BURDENS.;

418 PETTERSSEN, SVERRE;
SOME WEATHER INFLUENCES DUE TO WARMING OF THE AIR BY THE GREAT LAKES IN WINTER;
(1960) GREAT LAKES RESEARCH DIVISION, PUBLICATION 4, PP9-20;
METEOROLOGY; LAKES; PRECIPITATION; AIR-SEA HEATING-COOLING; MATHEMATICAL MODELS;
2790; GCODE0; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5;

419 PHILBERT, FRANCIS J.;
THE EFFECT OF SAMPLE PRESERVATION BY FREEZING PRIOR TO CHEMICAL ANALYSIS OF GREAT LAKES WATERS;
(1973) PROC 16TH CONF GREAT LAKES RES, P282-293;
WATER; SAMPLE COLLECTION; LAKES; CHEMICAL COMPOSITION; METHODS; ANALYSIS;
IGA-C16-1973; CAN-CC1W-CR-6; GCODE3; GCODE5;
THE MAIN OBJECTIVE OF THE STUDY WAS TO INVESTIGATE HOW FREEZING AND STORAGE OF LAKE WATER SAMPLES AFFECTED THEIR CHEMICAL CHARACTERISTICS PARTICULARLY IN RELATION TO NUTRIENT CONCENTRATIONS. WATER SAMPLES COLLECTED AT VARIOUS DEPTHS FROM DIFFERENT LOCATIONS IN LAKES ONTARIO AND HURON WERE STUDIED. SAMPLES WERE ANALYSED, IMMEDIATELY AFTER COLLECTION AND AGAIN AFTER FREEZING, FOR NUTRIENTS, TOTAL ALKALINITY AND CHLORIDE. THE EFFECT OF THE TIME FACTOR OF SAMPLE STORAGE WAS ALSO INVESTIGATED. CONSIDERABLE DECREASE IN TOTAL ALKALINITY VALUES WAS OBSERVED FOR LAKE ONTARIO AND, TO A LESSER EXTENT, FOR LAKE HURON SAMPLES. GENERALLY, THE BEHAVIOUR OF WATER SAMPLES FROM BOTH LAKES WAS SIMILAR. SOLUBLE REACTIVE SILICA AND PHOSPHORUS CONCENTRATIONS WERE DECREASED IN THE THAWED SAMPLES: CHANGES OBSERVED FOR AMMONIA AND NITRATE + NITRITE-N CONCENTRATIONS, ALTHOUGH SOMEWHAT INCONSISTENT, INDICATED TRENDS TOWARDS DECREASES IN AMMONIA AND INCREASES IN NITRATE + NITRITE-N. THERE WERE MARKED DECREASES IN DISSOLVED ORGANIC NITROGEN CONCENTRATIONS. TOTAL PHOSPHORUS APPEARED TO BE AFFECTED SLIGHTLY, WHILE DISSOLVED CHLORIDE EXHIBITED TRENDS TOWARDS SLIGHTLY LOWER CONCENTRATIONS. INCREASES IN SOLUBLE REACTIVE SILICA AND PHOSPHORUS CONCENTRATIONS WERE OBSERVED WHEN ANALYSIS OF THE THAWED SAMPLE WAS DELAYED. THE EXTENT OF REDUCTION OF TOTAL ALKALINITY DEPENDED ON THE DURATION OF SAMPLE FREEZING;

420 PICKARD AND ANDERSON, ENGINEERS;
STREAMBANK EROSION ON THE GENESEE RIVER ALONG BLACK RIVER ROAD IN TOWN OF AMITY, NEW YORK;
(1978) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP8 + APP;
EROSION; DEVELOPMENT PLANNING; SHORE; COST-BENEFIT ANALYSIS; ENGINEERING; FLOODS;

US-CE-BU-F5C2T5A; GCODE5C2T5;

421 PICKARD AND ANDERSON, ENGINEERS;
STREAMBANK EROSION ON THE GENESEE RIVER AT HOUGHTON, NY, SEWAGE TREATMENT PLANT;
(1978) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP14 +;
EROSION; FLOODS; ENGINEERING; ENVIRONMENT; IMPACT; COST-BENEFIT; ANALYSIS;
ECONOMICS;
US-CE-BU-F5C2T5C; GCODE5C2T5;

422 PICKETT, ROBERT L.;
LAKE ONTARIO TEMPERATURE AND CURRENT PROFILES;
(1976) IFYGL B NO 16, PP53-55;
DISTRIBUTION; TEMPERATURE; CURRENTS;
IFY-B16; GCODE5;

423 PICKET, ROBERT L.; BERMICK, STEPHEN;
LAKE ONTARIO MECHANICAL ENERGY;
(1976) IFYGL B NO 16, PP56-58;
TEMPERATURE; CURRENTS; MATHEMATICAL MODELS;
IFY-B16; GCODE5;

424 PICKETT, ROBERT L.; BERMICK, STEPHEN;
OBSERVED RESULTANT CIRCULATION OF LAKE ONTARIO;
(1977) LIMNOL AND OCEANOGR 22(6):1071-1076;
CURRENTS; VELOCITY; WIND;
7218; GCODE5;
VECTOR-AVERAGED CURRENT DATA FROM JUNE-OCT 1972 SUGGEST THAT LAKE ONTARIO'S RESULTANT CIRCULATION DURING THE STRATIFIED PERIOD CONSISTS OF A DOMINANT COUNTERCLOCKWISE GYRE TOGETHER WITH A SMALL CLOCKWISE GYRE IN THE NORTHWEST PORTION OF THE LAKE. CURRENT SPEEDS ARE LOWEST IN SPRING AND HAVE MAXIMUM VERTICAL SHEAR IN EARLY AUTUMN. SPECTRA COMPARING SUMMER AND WINTER WINDS AND CURRENTS SHOW MORE HIGH FREQUENCY ENERGY IN SUMMER WINDS AND CURRENTS AND MORE LOW FREQUENCY ENERGY IN WINTER WINDS AND CURRENTS.;

425 PIECH, KENNETH R.;
IDENTIFYING AND MEASURING THE POLLUTANTS IN OUR WATERWAYS;
(1969) RESEARCH TRENDS, PP43-46;
WATER; POLLUTION; MEASUREMENT; MONITORING; AERIAL PHOTOGRAPHY; SPECTRAL
ANALYSIS;
1433; GCODE5A4T3;

426 PLUHOWSKI, EDWARD J.;
DYNAMICS OF TURBIDITY PLUMES IN LAKE ONTARIO;
(1975) US DEPT INTERIOR GEOLOGICAL SURVEY OPEN-FILE REPORT 75-249, PP59;
TURBIDITY; PLUMES; CURRENTS; REMOTE SENSING; BEACH EROSION; EROSION; SUSPENDED
SOLIDS; MEASUREMENT;
US-IG-OFR-75-249; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3;
GCODE5D5; GCODE5C2T5; GCODE5A4T3; GCODE5A4T1; GCODE5D3T4;
FIELD ACTIVITIES AND IMAGE ANALYSES FOCUSED ON THE 275-KM LONG SOUTH SHORE OF LAKE ONTARIO. LANDSAT-1 IMAGES WERE SCREENED FOR LARGE-SCALE TURBIDITY FEATURES. THE STANFORD RESEARCH INSTITUTE ESIAC CONSOLE WAS USED TO ENHANCE, ENLARGE, AND TO OBTAIN AREAL MEASUREMENTS OF TURBIDITY PLUMES PORTRAYED IN SATELLITE IMAGES. GROUND-TRUTH MEASUREMENTS OF TEMPERATURE, TURBIDITY, AND SEVERAL METEOROLOGIC PARAMETERS WERE OBTAINED AT SELECTED SITES ALONG THE SOUTH SHORE OF THE LAKE, AT TIMES COINCIDING WITH SATELLITE OVERPASSES. LARGE WELL-DEFINED TURBIDITY PLUMES WERE FREQUENTLY OBSERVED AT THE MOUTHS OF THE FOLLOWING WATERCOURSES: NIAGARA RIVER, WELLAND CANAL, OSWEGO RIVER, GENESEE RIVER. ACCORDINGLY, MUCH OF THE FIELD WORK AND INTERPRETIVE ANALYSIS IN THIS STUDY FOCUSED ON THE DETECTION OF NEARSHORE LAKE CURRENTS ADJACENT TO THE OUTLETS OF THESE LARGE WATERCOURSES USING THE PLUMES AS TRACERS.;

427 PLUHOWSKI, EDWARD J.;
REMOTE SENSING OF TURBIDITY PLUMES IN LAKE ONTARIO;
(1976) TRANSPORTATION ENGINEERING JOURNAL, VOL. 102, NO. TE3, PP. 475-486.;

BEACH EROSION; CURRENTS; HYDROLOGY; REMOTE SENSING; SEDIMENT; TURBIDITY;
6927; GCODE5;
SPACE IMAGERY AND HIGH-ALTITUDE PHOTOGRAPHY PROVIDE AN EFFECTIVE METHOD OF MONITORING THE DYNAMICS OF TURBIDITY PLUMES IN LAKE ONTARIO. THE NIAGARA RIVER PLUME, AS MUCH AS 200 SQ MILES (520 KM2)IN AREA, IS BY FARTHE LARGEST TURBIDITY FEATURE IN THE LAKE. PLUME ANALYSES CORROBORATES THE PRESENCE OF A PREVAILING EASTWARD FLOWING LONGSHORE CURRENT ALONG THE ENTIRE SOUTH SHORE OF THE LAKE. THIS CURRENT IS MOST PERSISTENT AT THE OSWEGO RIVER OUTLET BUT IT IS QUITE VARIABLE IN THE ROCHESTER EMBAYMENT, WHERE RAPID SHIFTS IN WATER MOVEMENT WERE OCCASIONALLY DETECTED. THE POSITION OF THE SPRING THERMAL BAR, A ZONE OF MAXIMUM DENSITY WATER CORRESPONDING TO THE 4DEG C ISOTHERM, WAS LOCATED NEAR THE NIAGARA RIVER OUTLET IN IMAGES OBTAINED DURING APRIL, 1973.;

428 POLCYN, FABIAN C.;
A REMOTE SENSING PROGRAM FOR THE DETERMINATION OF CLADOPHORA DISTRIBUTION IN LAKE ONTARIO (IFYGL);
(1973) US EPA 1ST ANNUAL REPORTS FOR THE EPA IFYGL PROJECTS, PP330-336;
REMOTE SENSING; IFYGL; PROGRAMS; CLADOPHORA; DISTRIBUTION; PHYTOPLANKTON; ALGAE; CHLOROPHYTA;
US-EPA-660/3-73-021; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D4;

429 POLCYN, FABIAN C.; REBEL, DIANA C.; COLWELL, JOHN E.;
ANALYSIS OF HYDROLOGICAL FEATURES OF PORTIONS OF THE LAKE ONTARIO BASIN USING SKYLAB AND AIRCRAFT DATA;
(1975) US. NASA. 93PP;
REMOTE SENSING; HYDROLOGY; SOIL; IHD; REMOTE SENSING SATELLITE;
US-NASA-CR-ERIM-102300-19-F; GCODE5;
THE USEFULNESS OF SKYLAB AND AIRCRAFT DATA FOR MAPPING FEATURES OF HYDROLOGICAL INTEREST IN PORTIONS OF THE LAKE ONTARIO DRAINAGE BASIN HAS BEEN INVESTIGATED. S190A AND S190B PHOTOGRAPHY ARE USEFUL FOR MAPPING LARGE SCALE GEOMORPHOLOGICAL FEATURES AND FOR ASSESSING WATER DEPTH AND WATER QUALITY. THE AVAILABLE S192 DATA WAS AFFECTED BY LOW FREQUENCY NOISE DUE TO A DIODE LIGHT WHICH WAS INADVERTENTLY LEFT ON DURING DATA COLLECTION, BUT DATA PREPARATION WAS SUCCESSFUL IN PARTIALLY REDUCING THIS PROBLEM. THE RESULTING DATA WAS PROCESSED USING A RED, NEAR IR, AND THERMAL BAND TO PRODUCE A MAP AND AREAL STATISTICS OF HYDROLOGICALLY SIGNIFICANT FEATURES. A THERMAL MODEL AND A REFLECTANCE MODEL FOR DETERMINATION OF SOIL MOISTURE WERE DEVELOPED AND IMPLEMENTED ON AIRCRAFT DATA OVER A SITE WHERE FIELD DETERMINATIONS OF SOIL MOISTURE HAD BEEN MADE. THE REFLECTANCE MODEL APPEARS TO HAVE PROMISE FOR INFERRING SURFACE SOIL MOISTURE IN PARTIALLY VEGETATED TERRAIN;

430 POLLOCK, DAVID M.;
WOODBRIDGE RADAR OBSERVING AND DATA PROCESSING SYSTEM;
(1972) IFYGL B NO 4, PP23-25;
DATA PROCESSING; IFYGL; CANADA; RESEARCH; PROGRAMS;
IFY-B4; GCODE5;

431 PORTER, RUTH B.;
THE STORY OF SOMERSET;
(1972) NIAGARA COUNTY HISTORICAL SOCIETY OCCASIONAL CONTRIBUTIONS NO. 21;
SOMERSET; NY; NIAGARA COUNTY; HISTORY;
BUTLER; GCODE5B2;

432 POUND, ARTHUR;
LAKE ONTARIO;
(1945) KENNIKAT PRESS EMPIRE STATE HISTORICAL PUB SERIES NO 87;
HISTORY;
BUTLER; GCODE5;

433 PRANTER, ELAINE; HASSAN, JAMES E.;
ANNOTATED BIBLIOGRAPHY OF LAKE ONTARIO LIMNOLOGICAL AND RELATED STUDIES. VOLUME II - BIOLOGY;
(1973) US EPA ECOLOGICAL RESEARCH SERIES REPORT NO EPA-R3-73-028B, PP236;

WATER; POLLUTION; BIOLOGY; PHYTOPLANKTON; ZOOPLANKTON; WATER QUALITY; AVES; ALGAE; CYANOPHYTA; CHLOROPHYTA; CHRYSOPHYTA; PROTOZOA, BENTHOS; ARTHROPODA; INSECTA; PARASITES; SAMPLE COLLECTION; METHODS; NETS; INSTRUMENTS; BIBLIOGRAPHY;
REF-E-US-EPA-R3-73-028B; GCODE5;
596 PAPERS CONCERNING BIOLOGICAL ASPECTS OF LAKE ONTARIO INFLUENT TRIBUTARIES AND LAKE ONTARIO WERE REVIEWED AND ABSTRACTED. EACH PAPER WAS CROSS-INDEXED BY AUTHOR, GEOGRAPHIC AREA OF LAKE AND/OR TRIBUTARY IN WHICH STUDY WAS PERFORMED, ORGANISM, HABITAT NICHE AND TECHNIQUES AND INSTRUMENTATION. IN ADDITION, A LIST OF ADDRESSES FOR THE AUTHORS AND AGENCIES WAS INCLUDED ALONG WITH OTHER POSSIBLY PERTINENT REFERENCES WHICH THE AUTHORS WERE NOT ABLE TO SECURE AND REVIEW WITHIN THE TIME LIMITATIONS OF THE GRANT.;

434 PRINCE, ALAN T.; BRUCE, JAMES P.;
ORGANIZATION OF RESEARCH AND PLANNING ACTIVITIES ON THE LAURENTIAN GREAT LAKES;
(1968) OECD SYMPOSIUM ON LARGE LAKES, UPPSALA, SWEDEN. 30PP;
RESEARCH; REGULATION; LEGISLATION; REGULATORY AGENCY; MANAGEMENT; PROGRAMS; US; CANADA;
231F; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

435 PROTO, DANIEL D.; SWEENEY, ROBERT A.;
ANNOTATED BIBLIOGRAPHY OF LAKE ONTARIO LIMNOLOGICAL AND RELATED STUDIES. VOLUME I - CHEMISTRY;
(1973) US EPA ECOLOGICAL RESEARCH SERIES REPORT NO EPA-R3-73-028A, PP162;
BIBLIOGRAPHY; DREDGING; WATER; POLLUTION; CHEMISTRY; WASTE TREATMENT; WATER QUALITY; METHODS; ANALYSIS; PH; ALKALINITY; NUTRIENTS; HEAVY METALS; CONDUCTIVITY; HARDNESS; TEMPERATURE; TURBIDITY; INSTRUMENTS;
REF-E-US-EPA-R3-73-028A; GCODE5;
187 PAPERS CONCERNING CHEMICAL ASPECTS OF LAKE ONTARIO AND INFLUENT TRIBUTARIES WERE REVIEWED AND ABSTRACTED. EACH PAPER WAS CROSS-INDEXED BY AUTHOR, GEOGRAPHIC AREA OF LAKE AND/OR TRIBUTARY IN WHICH STUDY WAS PERFORMED, TECHNIQUE AND INSTRUMENTATION AND PARAMETERS. IN ADDITION, A LIST OF ADDRESSES FOR THE AUTHORS AND AGENCIES WAS INCLUDED ALONG WITH OTHER POSSIBLY PERTINENT REFERENCES WHICH THE AUTHORS WERE NOT ABLE TO SECURE AND REVIEW WITHIN THE TIME LIMITATIONS OF THE GRANT.;

436 QUINLAN, D. W.;
CONFLICTS ARISING FROM THE USE OF SHORE PROPERTY ON THE GREAT LAKES;
(1966) PROC GREAT LAKES WATER RESOURCES CONF, PP149-153;
LAND USE; SHORE DEVELOPMENT;
CAN-EIC-1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
SHORELINE DEVELOPMENT ALONG THE GREAT LAKES HAS INCREASED OVER THE PAST ONE HUNDRED YEARS TO THE POINT WHERE TODAY ALMOST 10% OF THE TOTAL POPULATION OF CANADA AND THE US LIVE WITHIN THE GREAT LAKES BASIN. A RELATIVELY NARROW STRIP ALONG THE APPROXIMATELY 10,000 MILES OF SHORELINE IN THE US AND CANADA ON WHICH THIS DEVELOPMENT HAS TAKEN PLACE REPRESENTS SOME OF THE MOST VALUABLE REAL ESTATE ON THE CONTINENT. INVESTMENT IN THE PRESENT CANADIAN SHORELINE ALONE IS CONSERVATIVELY ESTIMATED AT 2 1/2 BILLION DOLLARS. THIS INVESTMENT HAS BEEN MADE BY VARIOUS INTERESTS, RANGING FROM A SUMMER COTTAGE TO A MAJOR INDUSTRIAL COMPLEX, EACH WITH ITS OWN PECULIAR REQUIREMENTS. ABOUT THE ONLY THING COMMON TO THE VARIOUS INTERESTS IS THE DESIRE TO BE LOCATED ON OR NEAR THE GREAT LAKES SHORELINE. IT IS NOT SURPRISING, THEREFORE, TO FIND THAT CONFLICTS EXIST BETWEEN SHORE PROPERTY USERS. FOR EXAMPLE, THERE IS THE CONTINUING CONFLICT BETWEEN URBAN AND INDUSTRIAL EXPANSION; OPEN LAND USE; THE CONFLICT BETWEEN AGRICULTURAL AND INDUSTRIAL USE; AND THE CONFLICT BETWEEN COMMERCIAL-INDUSTRIAL DEVELOPMENT AND THE PRESSING REQUIREMENT FOR MORE AND MORE RECREATIONAL FACILITIES. SINCE THERE WILL CONTINUE TO BE CONFLICTS IN THE FUTURE, WITH INCREASED DEVELOP ENT AND CHANGES IN LAND USE, IT IS ESSENTIAL THAT ADEQUATE LAND USE PLANNING BE CARRIED OUT TO ENSURE MAXIMUM BENEFIT TO ALL CONCERNED, FROM THIS GREAT RESOURCE.;

437 QUINN, FRANK H.; DEN HARTOG, GERRIT;
EVAPORATION SYNTHESIS PANEL
PROC IFYGL WRAP-UP WORKSHOP, P59-68.
EVAPORATION; MATHEMATICAL MODELS;

IFY-822; GCODE5;

438 RAO, DESIRAJU B.; MURTY, TADEPALLI S.;
CALCULATION OF THE STEADY STATE WIND-DRIVEN CIRCULATIONS IN LAKE ONTARIO;
(1970) ARCH. MET. GEOPH. BIOKL. SER. A. VOL. 19. PP195-210;
MATHEMATICAL MODELS; WIND; TOPOGRAPHY; CURRENTS;
2608; GCODE5;
NUMERICAL CALCULATIONS WERE MADE TO DETERMINE THE STEADY STATE FEATURES OF THE WIND-DRIVEN CIRCULATIONS IN LAKE ONTARIO. IT IS ASSUMED THAT THE WATER IN THE LAKE MAY BE REPRESENTED BY AN INCOMPRESSIBLE HOMOGENEOUS FLUID LAYER, A CONDITION THAT IS TYPICAL OF A WINTER SITUATION. THE LINEARIZED MASS TRANSPORT EQUATIONS ARE THEN SOLVED FOR AN IMPOSED WIND STRESS ON THE SURFACE OF THE LAKE. EFFECTS OF BOTTOM FRICTION, BOTTOM TOPOGRAPHY, LATERAL BOUNDARY CONFIGURATION ARE TAKEN INTO ACCOUNT. EFFECT OF ROTATION IS REPRESENTED BY A CONSTANT CORIOLIS PARAMETER. CIRCULATION PATTERNS WERE CALCULATED FOR THE CASES OF UNIFORM AND SPACIALLY VARIABLE WIND STRESS. IT WAS SHOWN THAT BOTTOM TOPOGRAPHY STRONGLY INFLUENCES THE CIRCULATION FEATURES. THE DOMINANT FEATURE OF THE CIRCULATION IS A TWO-CELL PATTERN WITH A SMALL COUNTER-CLOCKWISE CIRCULATION CELL IN THE SOUTHERN PART OF THE LAKE AND A LARGE CLOCKWISE CELL IN THE NORTHERN PART WITH AN INTENSE WEST-WARD RETURN FLOW IN THE INTERIOR OF THE LAKE;

439 RAO, SALEM S.; BUKATA, ROBERT P.;
THE DELINEATION OF A POINT SOURCE PLUME BY THE STUDY OF BACTERIAL POPULATIONS;
(1977) J APPLIED BACTERIOLOGY 43:61-66;
BACTERIA; PLUMES; NUTRIENT LOADING; MEASUREMENT; ANALYSIS; DISCHARGE FLOW;
7251; GCODE5A4T3;
RECENT POINT SOURCE MICROBIOLOGICAL STUDIES, USING RADIAL GRID SAMPLING STATIONS, HAVE INDICATED THE POTENTIAL OF USING BACTERIAL POPULATIONS TO DELINEATE MIXING ZONES AND IDENTIFY THE PLUMES. THE DISCHARGE FROM THE NIAGARA RIVER INTO LAKE ONTARIO WAS STUDIED AND MICROBIOLOGICAL DATA FROM THE MAIN PLUME AREA (IMPACT ZONE), ZONE OF MINOR INFLUENCE OF THE PLUME, AND THE NON-PLUME LAKE WATERS ARE PRESENTED. THE MICROBIOLOGICAL OBSERVATIONS WERE FOUND TO AGREE WITH THERMAL OBSERVATIONS OF THE PLUME AREA MADE BY REMOTE SENSING SCANNING TECHNIQUES.;

440 RAO, SALEM S.; DUTKA, BERNARD J.;
INFLUENCE OF TEMPERATURE ON LAKE BACTERIAL ACTIVITY;
(1974) WATER RESEARCH 8(8):525-526;
TEMPERATURE; BACTERIA; OXYGEN; BIODEGRADABILITY; ESCHERICHIA; LAKES;
CAN-CCIW-CR-7; GCODE2; GCODE5; GCODE7;
OXYGEN UTILIZATION RATES OF ISOLATES OF FLAVOBACTERIUM FROM LAKE ONTARIO AND LAKE SUPERIOR, AND AN E. COLI FROM THE ST. LAWRENCE RIVER WERE OBSERVED AT 4 AND 20 DEGREES C. DATA PRESENTED INDICATE THAT THE OXYGEN UTILIZATION RATE OF THE LAKE BACTERIA AT 4 DEGREES C IS SIMILAR TO THAT OF THE RIVER BACTERIA AT 20 DEGREES C. THE OBSERVATION IS ALSO EXTENDED TO EXPLAIN THE SEEMINGLY SATISFACTORY BIODEGRADATION OF NUTRIENTS DISCHARGED INTO WATER BODIES IN TEMPERATE CLIMATES;

441 RASTONIS, STASYS A.; MALE, JAMES W.; ALLEN, HERBERT E.;
CONCEPTUAL FRAMEWORK FOR COORDINATED GREAT LAKES MONITORING;
(1976) J GREAT LAKES RES 4(2):117-126;
MONITORING; MODEL STUDIES; CANADA; US; METHODS;
7873; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE UTILITY OF CONCEPTUAL MODELS IS DISCUSSED AS A BASIS FOR EFFECTIVE DEVELOPMENT OF COORDINATED MONITORING EFFORTS ON THE GREAT LAKES. THE USE OF CONCEPTUAL MODELS IS ILLUSTRATED IN 2 WAYS: (1) THE DEVELOPMENT OF A METHODOLOGY FOR SPECIFYING MONITORING OBJECTIVES OF THE GREAT LAKES, BASED ON A CONCEPTUAL MODEL, AND (2) PRESENTATION OF A COMPREHENSIVE METHOD FOR DEFINING RESOURCE NEEDS TO ACHIEVE MONITORING OBJECTIVES.;

442 REIGHARD, JACOB E.;
SOME PLANKTON STUDIES IN THE GREAT LAKES;
(1893) B US FISH COMMISSION PP127-142;
PHYTOPLANKTON; ZOOPLANKTON; ALGAE; PROTOZOA; MOLLUSCA; FISH; EQUIPMENT; METHODS;

6660; GCODE1; GCODE2; GCODE3; GCODE4A; GCODE5; GCODE6;

443 REGIER, HENRY A.;
ECOSYSTEM UNDERSTANDING;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P55;
MAPPING; RESOURCES; MANAGEMENT; MONITORING; MODEL STUDIES;
IJC-RA7; GCODE6;

44 REINERT, ROBERT E.;
INSECTICIDES AND THE GREAT LAKES;
( ) LIMNOS GREAT LAKES FOUNDATION. VOL. 2, NO. 3. PP. 3-9.;
INSECTICIDES; DDT; HISTORY; SALVELINUS NAMAYCUSH; SALVELINUS FONTINALIS; FISH; ONCORHYNCHUS; CHLORINATED HYDROCARBON INSECTICIDES; TOXICITY; PESTICIDES;
5573; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

445 REINERT, ROBERT E.;
PESTICIDE CONCENTRATIONS IN GREAT LAKES FISH;
(1970) PESTICIDES MONITORING JOURNAL. VOL. 3, NO. 4. PP. 233-240.;
PESTICIDES; FISH; DDT; DIELDRIN; INSECTICIDES; METHODS; ANALYSIS; WATER; CHLORINATED HYDROCARBON PESTICIDES;
5608; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
DURING THE PAST 4 YEARS THE ANN ARBOR GREAT LAKES FISHERY LABORATORY OF THE BUREAU OF COMMERCIAL FISHERIES HAS BEEN MONITORING INSECTICIDE LEVELS IN FISH FROM THE GREAT LAKES. THE TWO INSECTICIDES FOUND IN ALL GREAT LAKES FISH HAVE BEEN DDT (DDT, DDD, DDE) AND DIELDRIN. FISH FROM LAKE MICHIGAN CONTAIN FROM 2 TO 7 TIMES AS MUCH OF THESE INSECTICIDES AS THOSE FROM THE OTHER GREAT LAKES. INSECTICIDE LEVELS CALCULATED ON A WHOLE-FISH BASIS SHOW A MARKED DIFFERENCE FROM SPECIES TO SPECIES. WITHIN A SPECIES THERE IS ALSO AN INCREASE IN DDT AND DIELDRIN LEVELS WITH AN INCREASE IN SIZE. IF THESE INSECTICIDE LEVELS ARE, HOWEVER, CALCULATED AS PPM OF INSECTICIDE IN THE EXTRACTABLE FISH OIL, THE DIFFERENCES IN CONCENTRATION BETWEEN SIZE GROUPS BECOMES CONSIDERABLY LESS. LABORATORY EXPERIMENTS INDICATE THAT FISH CAN BUILD UP CONCENTRATIONS OF DDT AND DIELDRIN AT THE PARTS-PER-MILLION LEVEL FROM PARTS-PER--TRILLION CONCENTRATIONS IN THE WATER;

446 REINWAND, JERRY F.;
PLANKTONIC DIATOMS OF LAKE ONTARIO;
(1969) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 14. PP. 19-26.;
ASTERIONELLA; FRAGILARIA; TABELLARIA; STEPHANODISCUS; PHYTOPLANKTON; BACILLARIOPHYCEAE;
GLF-TR14; GCODE5;
THE MAJOR SPECIES OF DIATOMS IN SURFACE COLLECTIONS FROM LAKE ONTARIO IN SEPTEMBER 1964 WERE ASTERIONELLA FORMOSA, FRAGILARIA CROTONENSIS, AND TABELLARIA FENESTRATA, DOMINANT SPECIES IN THE DEEP-WATER SAMPLES WERE STEPHANODISCUS ASTRAEA, S. ASTRAEA VAR. MINTULA, AND F. CROTONENSIS. THE DIATOM FLORA IN SURFACE COLLECTIONS VARIED AMONG SEVERAL STATIONS IN THE EASTERN END OF THE LAKE.;

447 RICHARDS, T. LLOYD; RODGERS, G. KEITH;
AN INVESTIGATION OF THE EXTREMES OF ANNUAL AND MONTHLY EVAPORATION FROM LAKE ONTARIO;
(1964) U OF MI GREAT LAKES RES DIVISION PROC 7TH CONF GREAT LAKES RES, P283-293;
EVAPORATION; MATHEMATICAL MODELS;
134; IGR-C7-1964; GCODE5;

448 RICHARDSON, WILLIAM L.; THOMAS, NELSON A.;
A REVIEW OF EPA'S GREAT LAKES MODELING PROGRAM;
(1976) US EPA PROC. OF THE CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION. PP20-25;
MATHEMATICAL MODELS; WATER QUALITY; EUTROPHICATION; DATA PROCESSING;
7060; GCODE3; GCODE4; GCODE5; GCODE6; GCODE3C;

449 RICKARD, LAWRENCE V.;
UPPER SILURIAN CAYUGAN SERIES, NIAGARA FRONTIER, NEW YORK;
(1966) GEOLOGY OF WESTERN NEW YORK GUIDEBOOK, NY STATE GEOLOGICAL ASSOC 38TH ANNUAL MEETING, PP24-31;
GEOLOGY; NY;
NYG-38; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE4G;

450 RINGLER, NEIL H.;
FEEDING ECOLOGY OF FISHES IN THE ST. LAWRENCE RIVER;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP91-109;
FOOD; FISH;
NY-US-FF-SL; GCODE7;

451 ROBERTSON, ANDREW;
AVAILABILITY OF INFORMATION FOR MAPPING PLANKTON DISTRIBUTIONS IN THE GREAT LAKES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P121-126;
PHYTOPLANKTON; ZOOPLANKTON; DISTRIBUTION; MAPPING;
IJC-RA7; GCODE6;

452 ROBERTSON, ANDREW;
THE DISTRIBUTION OF CALANOID COPEPODS IN THE GREAT LAKES;
(1966) U OF MI GREAT LAKES RES DIVISION PROC 9TH CONF GREAT LAKES RES, P129-139;
COPEPODA; DIAPTOMUS; LIMNOCALANUS; SENECELLA; ABUNDANCE; DISTRIBUTION;
IGR-C9-1966; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE GEOGRAPHICAL DISTRIBUTION OF THE 10 CALANOID COPEPODS IN THE GREAT LAKES HAS BEEN STUDIED THROUGH A SYNTHESIS OF THE PREVIOUSLY PUBLISHED IDENTIFICATIONS WITH A LIMITED NUMBER OF ORIGINAL DETERMINATIONS. 6 SPECIES, DIAPTOMUS ASHLANDI, D. MINUTUS, D. OREGONENSIS, D. SICILIS, EPISCHURA LACUSTRIS AND LIMNOCALANUS MACRURUS, HAVE BEEN FOUND IN ALL THE LAKES. SENECELLA CALANOIDES HAS BEEN FOUND IN ALL THE LAKES BUT ERIE; EURYTEMORA AFFINIS IN LAKES ONTARIO, ERIE AND MICHIGAN; D. SICILOIDES IN ONTARIO AND ERIE; AND D. REIGHARDI ONLY IN ERIE. 2 OF THE SPECIES THAT OCCUR IN ALL THE LAKES, D. SICILIS AND L. MACRURUS, ARE MORE ABUNDANT IN THE NORTHERN LAKES; THE INVERSE IS TRUE OF D. OREGONENSIS. THE RELATIVE ABUNDANCES OF DIAPTOMIDS IN LAKE MICHIGAN IN 1964, IN LAKE MICHIGAN IN 1954-55, AND IN LAKE ERIE IN 1956-57 WERE COMPARED. THIS SHOWED THAT D. OREGONENSIS WAS RELATIVELY MORE ABUNDANT IN LAKE ERIE IN 1956-57, AND D. SICILIS IN LAKE MICHIGAN IN 1954-55. THE SEASON OF MAXIMUM ABUNDANCE OF A SPECIES WAS GENERALLY EARLIER IN LAKE ERIE IN 1956-57 THAN IN LAKE MICHIGAN IN 1954-55. THE CONDITIONS IN LAKE MICHIGAN IN 1964 WERE INTERMEDIATE IN BOTH THESE RESPECTS;

453 ROBERTSON, ANDREW;
U.S. IFYGL SHIPBOARD DATA ACQUISITION SYSTEM;
(1974) IFYGL TECHNICAL MANUAL SERIES NO 5, PP40;
IFYGL; US; RESEARCH; DATA PROCESSING; REMOTE SENSING; MEASUREMENT; METHODS; BOATS;
IFY-TM5; GCODE5;

454 ROBERTSON, ANDREW; EADIE, BRIAN J.;
A CARBON BUDGET FOR LAKE ONTARIO;
(1975) INTERNAT ASSOC OF THEORETICAL AND APPLIED LIMNOLOGY PROC CONGRESS IN CANADA V 19, PP291-299;
CARBON; INORGANIC CARBON; MATHEMATICAL MODELS;
ITL-C-1974-P1; GCODE5A4T3; GCODE5D3T4; GCODE5C2T5; GCODE5D4T1; GCODE7;

455 ROCHESTER GAS AND ELECTRIC CORPORATION;
GINNA NUCLEAR POWER PLANT 316(A) DEMONSTRATION SUPPLEMENT;
(1977) ROCHESTER GAS AND ELECTRIC 5 SECTIONS UNPAGED;
THERMAL; PLUMES; NUCLEAR POWER GENERATING STATIONS; CLADOPHORA; ABUNDANCE; GAMMARUS; BENTHOS; FISH; TOXIC LIMIT; TEMPERATURE; MATHEMATICAL MODELS; ALOSA PSEUDOHARENGUS; OSMERUS; SPAWNING; NOTROPIS; MORONE AMERICANA; MICROPTERUS DOLOMIEUI; ONCORHYNCHUS; SALMO TRUTTA; COMMUNITY STRUCTURE; EFFLUENTS;

REPRODUCTION; SURVIVAL; ENTRAINMENT; MIGRATION; DISEASES;
RGE-EI-G; GCCDE5C5;

456 ROCHESTER GAS AND ELECTRIC CORPORATION;
RUSSELL STATION 316(A) DEMONSTRATION;
(1977) 5 SECTIONS UNPAGED;
ELECTRIC POWER GENERATING STATIONS; THERMAL; PLUMES; DISTRIBUTION; ABUNDANCE;
EFFLUENTS; ENTRAINMENTS; MIGRATION; DISEASES; MATHEMATICAL MODELS; BENTHOS;
FISH; CLADOPHORA; GAMMARUS; ALOSA PSEUDOHARENGUS; OSMERUS; NOTROPIS; MORONE
AMERICANA; MICROPTERUS DOLOMIEUI; ONCORHYNCHUS; SALMO TRUTTA; SPAWNING;
SURVIVAL; TOXIC LIMIT;
RGE-EI-R; GCCDE5C2;

457 RODGERS, G. KEITH;
HEAT ADVECTION WITHIN LAKE ONTARIO IN SPRING AND SURFACE WATER TRANSPARENCY
ASSOCIATED WITH THE THERMAL BAR;
(1968) PROC 11TH CONF GREAT LAKES RES, P480-486;
TEMPERATURE; ADVECTION AND CONVECTION; STRATIFICATION; MESOLIMNION;
IGR-C11-1968; GCCDE5;
THE PATTERN OF HEAT CONTENT CHANGES THROUGHOUT LAKE ONTARIO DURING THE PERIOD IN
WHICH STRATIFICATION DEVELOPED (APRIL THROUGH JUNE) IN 1965 SUGGESTS THAT
ADVECTION OF WARM WATER FROM SHORE AREAS IS AN IMPORTANT FACTOR IN THE FORMATION
OF THE THERMOCLINE ON THE SHORE SIDE OF THE THERMAL BAR. PREVIOUS PAPERS ON THE
THERMAL BAR HAVE DESCRIBED THE HIGH CORRELATION OF TURBIDITY WITH TEMPERATURE AT
THE LAKE SURFACE IN THE REGION OF THE 4 DEGREES C ISOTHERM, BASED ON VISUAL
REPORTS. RECORDS OF CROSSINGS OF THIS ISOTHERM IN 1967 WITH A TOWED
TRANSMISSOMETER THERMOMETER CONFIRM THE CORRELATION QUANTITATIVELY AND ALSO
REVEAL IN DETAIL THE ASSOCIATED VARIETY OF HORIZONTAL TEMPERATURE GRADIENTS;

458 RODGERS, G. KEITH;
LAKE ONTARIO DATA REPORT - 1968;
(1963) U OF TORONTO GREAT LAKES INSTITUTE PRELIMINARY REPORT NO. 10, 192P;
TEMPERATURE; ICE; CURRENTS; METEOROLOGY; WIND; WAVES; RADIATION; CONDUCTIVITY;
PH; DISSOLVED OXYGEN;
CAN-UT-GLI-PR10; GCCDE5;

459 RODGERS, G. KEITH;
THE THERMAL BAR IN LAKE ONTARIO, SPRING 1965AND WINTER 1965-66;
(1966) U OF MI GREAT LAKES RES DIVISION PROC 9TH CONF GREAT LAKES RES, P369-374;
TEMPERATURE; CURRENTS;
IGR-C9-1966; GCCDE5;
THE TEMPERATURE AND WATER MASSES OF LAKE ONTARIO WERE STUDIED DURING THE SPRING
AND WINTER PERIODS WHEN WATERS ARE PRESENT AT TEMPERATURES BOTH ABOVE AND BELOW
THE TEMPERATURE OF MAXIMUM DENSITY. THE ZONE WHERE THE SURFACE WAS JUST AT THE
TEMPERATURE OF MAXIMUM DENSITY (THE THERMAL BAR) SEPARATING THESE WATERS
DEMONSTRATED MARKED HORIZONTAL GRADIENTS IN TEMPERATURE, TURBIDITY AND COLOUR.
THE MOVEMENT OF THE THERMAL BAR IS DOCUMENTED FOR THE SPRING CONDITION, AND
CURRENT MEASUREMENTS TAKEN IN THE BAR ARE SHOWN;

460 RODGERS, G. KEITH;
WATER MOTION AND TEMPERATURE OF GREAT LAKES WATERS;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON
ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P163-164;
CURRENTS; TEMPERATURE;
IJC-RA7; GCCDEE;

461 RODGERS, G. KEITH; SATO, GEN K.;
FACTORS AFFECTING THE PROGRESS OF THE THERMAL BAR OF SPRING IN LAKE ONTARIO;
(1970) PROC. 13TH CONF. GREAT LAKES RES. PP942-950;
TEMPERATURE; AIR-SEA MIXING; MESOLIMNION; LAKES; STRATIFICATION; THERMAL BAR;
2519; GCCDE5;
THE MOVEMENT OF THE SPRING THERMAL BAR IN LAKE ONTARIO HAS BEEN EXAMINED IN
RELATION TO THE HEAT CONTENT OF THE LAKE AND HEAT FLUX THROUGH THE LAKE SURFACE.

EVIDENCE IS PRESENTED SUPPORTING THE CONTENTION THAT THE PRIMARY CONTROL OF THERMAL BAR MOVEMENT LIES WITH SURFACE HEATING AND THE INITIAL HEAT CONTENT OF THE 'COLD' SECTION OF THE LAKE INTO WHICH THE THERMAL BAR MOVES. DATA ON 1 APRIL HEAT CONTENT, AND THE DATE OF DISAPPEARANCE OF THE THERMAL BAR IN LAKE ONTARIO IN THE YEARS FROM 1965 TO 1969 INCLUSIVE HAVE BEEN ANALYZED. CORRELATION EXISTS BETWEEN HEAT CONTENT IN THE DEEP SECTION ON 1 APRIL AND THE DATE OF DISAPPEARANCE OF THE THERMAL BAR. THE SCATTER IN THE DATA SUGGESTS THAT THE DATE MIGHT BE PREDICTED TO WITHIN 4 DAYS. THIS CORRELATION EXISTS BECAUSE THERE HAD BEEN LARGER VARIATIONS IN HEAT CONTENT THAN CUMULATIVE HEAT FLUX. THE HEAT CONTENT OF THE DEEP PART OF THE LAKE ON 1 APRIL (RELATIVE TO HEAT CONTENT OF THE LAKE WHEN STRATIFICATION JUST STARTS) VARIED BY A FACTOR OF 2. THE AVERAGE HEAT FLUX THROUGH THE LAKE SURFACE OVER THE MONTHS OF APRIL AND MAY IN THESE YEARS VARIED BY ONLY 15% FROM THE MEAN. IN A DISCUSSION OF WHAT CONSTITUTES THE BEGINNING OF THE SPRING THERMAL BAR, TWO REGIMES ARE IDENTIFIED. THE FIRST IS ASSOCIATED WITH THE PROGRESS OF THERMOCLINE DEVELOPMENT IN THE WHOLE LAKE AND ITS MOVEMENT IS CONTROLLED PRIMARILY BY SURFACE HEATING AND INITIAL LAKE TEMPERATURES IN THE DEEP PART OF THE LAKE. THE SECOND TYPE OF THERMAL BAR ARISES DUE TO FLOW OF WATERS GREATER THAN 4 DEGREES C INTO A LAKE AT TEMPERATURES LESS THAN 4 DEGREES C;

482 RODIN, ERVIN Y.;
BEHAVIOR OF NONCONSERVATIVE POLLUTANTS IN AQUEOUS ENVIRONMENTS;
(1969) J. WATER POLLUTION CONTROL FEDERATION. VOL. 41. NO. 11. PART 2. PPR475-R481;
POLLUTION; WATER; EUTROPHICATION; AEROBIC BACTERIA;
1670; GCODE6;

483 ROSEBURDUGH, J. DOUGLAS;
OBSERVATIONS OF OUR GREAT LAKES NEIGHBORS;
(1966) MI NATURAL RESOURCES COUNCIL, 11TH ANNUAL CONFERENCE. PP43-46;
COMMERCIAL FISHERIES; FISHING; FISH STOCKING;
MI-NRC-C11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE6;

484 ROSENBERGER, DAVID R.;
AREAS OF NONCOMPLIANCE PROBLEM AREAS IN THE GREAT LAKES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P175-185;
MAPPING; WATER QUALITY;
IJC-RA7; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

485 ROUSE, FREDERICK O.;
GREAT LAKES ALTERNATIVE FUTURES AND IMPACT ON RESEARCH;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP299-312;
RESEARCH;
US-FCS-P1972; GCODE6;

486 RUKAVINIA, NORMAN A.;
DISPERSION OF SHORE-AND STREAM-DERIVED SEDIMENTS BY NEARSHORE PROCESSES IN THE GREAT LAKES;
(1973) IJC PROC OF A WORKSHOP ON WATER QUALITY AND LAND USE ACTIVITIES, PP231-238;
DISPERSAL; SEDIMENT; LITTORAL DRIFT; SHORE PROCESSES; MODEL STUDIES;
IJC-R63; GCODE5;
THE LAKE ONTARIO NEARSHORE ZONE IS USED AS AN EXAMPLE OF HOW MAPPING OF NEARSHORE BOTTOM SEDIMENTS COMBINED WITH SHORE EROSION AND STREAM DISCHARGE DATA CAN PROVIDE A GENERALIZED MODEL OF NEARSHORE DISPERSION OF SEDIMENT. IN THE LAKE ONTARIO CASE, NET LITTORAL DRIFT IS EASTWARD IN THE EASTERN FOUR-FIFTHS OF THE BASIN AND WESTWARD IN THE WESTERN ONE-FIFTH. THIS IS IN RESPONSE TO PREVAILING WESTERLY WINDS AND INTERMITTENT EASTERLY STORMS RESPECTIVELY. THE RESULT IS A CONCENTRATION OF SEDIMENT AT THE TWO ENDS OF THE LAKE WITH SMALLER MID-COAST DEPOSITS WHERE LITTORAL DRIFT IS INTERRUPTED BY CHANGES IN SHORELINE CONFIGURATION OR BATHYMETRY. SEDIMENT SUPPLY IS MAINLY THE RESULT OF SHORE AND OFFSHORE EROSION OF GLACIAL DRIFT EXPOSED ALONG THE SOUTH SHORE AND CENTRAL NORTH SHORE.;

467 RUKAVINA, NORMAN A.;
NEARSHORE SEDIMENT SURVEY OF WESTERN LAKE ONTARIO, METHODS AND PRELIMINARY RESULTS;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP317-324;
MORPHOLOGY; SEDIMENT; BOTTOM; LITTORAL; EROSION; SEDIMENTATION OF BOTTOM AND SHORE;
1775; GCODE5A;
SURFACE SEDIMENT SAMPLES, ECHO SOUNDER PROFILES, AND BOTTOM OBSERVATIONS BY DIVERS AND WITH UNDERWATER TELEVISION ARE BEING USED TO MAP THE SEDIMENTS AND BOTTOM MORPHOLOGY OF NEARSHORE LAKE ONTARIO (DEPTH 0-20M). IN 1968 MAPPING WAS COMPLETED IN THE WESTERN END OF THE LAKE FROM NIAGARA ON THE SOUTH SHORE TO WHITBY ON THE NORTH SHORE. SIX BOTTOM TYPES HAVE BEEN RECOGNIZED AND DELINEATED: 1) BEDROCK 23%, 2) GLACIAL DRIFT 39%, AND THE RECENT SEDIMENTS 3) GRAVEL AND PEBBLY SAND 9%, 4) SAND 22%, 5) SILT-SAND 10%, AND 6) SILT-CLAY 7%. RECENT SEDIMENTS OCCUR: 1) ON THE SOUTH SHORE FROM NIAGARA TO JORDAN, 2) ON THE WEST SHORE OPPOSITE THE BURLINGTON BAR, AND 3) ON THE NORTH SHORE OPPOSITE METROPOLITAN TORONTO. THE DEPOSITS AT TORONTO AND NIAGARA RESULT FROM LOCAL EROSION OF SHORE BLUFFS; WESTWARD-MOVING LONGSHORE CURRENTS SUPPLY THE SEDIMENT ACCUMULATING OFFSHORE FROM THE BURLINGTON BAR;

468 RUPER, RALPH R.; ACRES CONSULTING SERVICES LIMITED;
LAKE ERIE-NIAGARA RIVER ICE BOOM STUDY;
(1974) IJC, PP59;
ICE CONTROL; ICE CONDITIONS; ICE COVER; HISTORY;
IJC-NBC-S1974; GCODE465; GCODE5A4T3;
THIS REPORT PRESENTS A DETAILED EXAMINATION OF THE CURRENT STATE OF KNOWLEDGE OF THE ICE DISSIPATION PROCESS IN LAKE ERIE AND THE POSSIBLE BOOM EFFECTS ON THIS DISSIPATION PROCESS;

469 RYDER, RICHARD A.;
THE MAINTENANCE OF ECOSYSTEM INTEGRITY ON THE GREAT LAKES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P167;
RIVERS ; ECOSYSTEMS; DISCHARGE FLOW;
IJC-WA7; GCODE6;

470 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
COASTAL RESOURCES. GEOLOGY;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION TECHNICAL REPORT SERIES 2, 64P;
GEOMORPHOLOGY; PHYSIOGRAPHY; SEISMICS; GLACIATION; COASTAL ZONE; SHORE PROCESSES;
SLE-TR2; GCODE7; GCODE5D4; GCODE5D5;

471 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
COASTAL RESOURCES. GOALS AND OBJECTIVES;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION TECHNICAL REPORT SERIES 1, 54P;
DEVELOPMENT PLANNING; RESOURCES; MANAGEMENT; COASTAL ZONE; LAND USE; RECREATION; WATER SUPPLY; WATER QUALITY;
SLE-TR1; GCODE7; GCODE5D4; GCODE5D5;

472 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
COASTAL RESOURCES. SOILS. INTERPRETATIVE SUPPLEMENT FOR CAYUGA COUNTY;
(1197) ST LAWRENCE - EASTERN ONTARIO COMMISSION TECHNICAL REPORT SERIES 3D, 73P, MAP;
SOIL; PHYSICAL CHARACTERISTICS; GEOMORPHOLOGY; LAND USE; VEGETATION; NY; CAYUGA COUNTY; MAPS;
SLE-TR3D; GCODE5D3;

473 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
COASTAL RESOURCES. SOILS. INTERPRETATIVE SUPPLEMENT FOR JEFFERSON COUNTY;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION TECHNICAL REPORT SERIES 3B, 132P, 7 MAPS;

SOIL; PHYSICAL CHARACTERISTICS; LAND USE; GEOMORPHOLOGY; VEGETATION; NY;
JEFFERSON COUNTY;
SLE-TR3P; GCODE504; GCODE505;

474 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
COASTAL RESOURCES. SOILS. INTERPRETATIVE SUPPLEMENT FOR OSWEGO COUNTY;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION TECHNICAL SERIES 3C, 111P, 5
MAPS;
SOIL; NY; OSWEGO COUNTY; GEOMORPHOLOGY; LAND USE; VEGETATION; MAPS; PHYSICAL
CHARACTERISTICS;
SLE-TR3-C; GCODE505; GCODE503;

475 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
COASTAL RESOURCES. SOILS. INTERPRETATIVE SUPPLEMENT FOR ST. LAWRENCE COUNTY;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION. TECHNICAL REPORT SERIES 3A,
63P, 3MAPS;
SOIL; GEOMORPHOLOGY; MAPS; LAND USE; VEGETATION; PHYSICAL CHARACTERISTICS; NY;
ST LAWRENCE COUNTY;
SLE-TR3A; GCODE7;

476 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
EVALUATION OF SHORE STRUCTURES AND SHORE ERODIBILITY ST. LAWRENCE RIVER NEW YORK
STATE;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION, 165P;
COASTAL ZONE; EROSION; STRUCTURES; HISTORY; MAN; IMPACT; METEOROLOGY;
SLE-S1; GCODE7;

477 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
REPORT ON COASTAL RESOURCES;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION, 92P;
COASTAL ZONE; LAND USE; RESOURCES; FISH; PLANTS; RECREATION; ECONOMICS; WATER
SUPPLY; LAKE LEVELS;
SLE-F1; GCODE7; GCODE504; GCODE505;

478 ST LAWRENCE - EASTERN ONTARIO COMMISSION;
REPORT ON COASTAL RESOURCES EXECUTIVE SUMMARY;
(1977) ST LAWRENCE - EASTERN ONTARIO COMMISSION, 16P;
COASTAL ZONE; RESOURCES; MANAGEMENT; LAND USE; RECREATION; ECONOMICS;
SLE-F1-S; GCODE7; GCODE504; GCODE505;

479 ST LAWRENCE - EASTERN ONTARIO COMMISSION:
STUDIES RELATED TO DEMONSTRATION ACTIVITIES FOR NAVIGATION SEASON EXTENSION
ALONG THE ST. LAWRENCE RIVER: CULTURAL RESOURCES;
(1978) ST LAWRENCE - EASTERN ONTARIO COMMISSION, 26P;
RECREATION; HISTORY; MAN; LAND USE; IMPACT; LAKE LEVELS;
SLE-S2; GCODE7;

480 ST LAWRENCE SEAWAY DEVELOPMENT CORPORATION;
QUESTIONS AND ANSWERS ON THE ST LAWRENCE SEAWAY;
(1960) US 86TH CONGRESS 2ND SESSION, COMMITTEE PRINT, 15P;
NAVIGATION; ENGINEERING; ECONOMICS; LEGISLATION; POPULATION ESTIMATE;
REF-L-US-86-2-CP; GCODE7;

481 SALBACH, STEVEN E.;
ENVIRONMENTAL MAPPING OF THE GREAT LAKES FOR MUNICIPAL INTAKES AND DISCHARGES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON
ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P29-32;
MAPPING; WATER SUPPLY;
IJC-RA7; GCODE6;

482 SALTFELD, ROBERT;
ROLE OF THE GREAT LAKES FISHERY COMMISSION;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP320-323;
RESEARCH; GREAT LAKES FISHERY COMMISSION;

US-FCS-P1972; GCODE6;

483 SALPEN, JAMES R.; FRISKEN, WILLIAM R.;
AN OBJECTIVE ANALYSIS SCHEME FOR SURFACE PRESSURE IN THE LAKE ONTARIO BASIN;
(1973) PROC 16TH CONF GREAT LAKES RES, P556-560;
IFYGL; MATHEMATICAL MODELS; METEOROLOGY;
IGP-C16-1973; GCODE5;
AN OBJECTIVE ANALYSIS PROGRAM BASED ON THE SUCCESSIVE APPROXIMATION TECHNIQUE HAS BEEN DESIGNED SPECIFICALLY FOR THE SURFACE PRESSURE FIELD IN THE LAKE ONTARIO BASIN. THIS SIMPLE, ECONOMICAL PROGRAM REQUIRES ONLY A SINGLE SYNOPTIC SET OF SURFACE PRESSURE DATA FOR THE ENTIRE COMPUTATION, INCLUDING THE INITIALIZATION OF THE ARRAY. IT COMPUTES A CHARACTERISTIC LENGTH AT EACH GRID POINT WHICH MODIFIES THE SCALE OF THE CORRECTION AND SMOOTHING ROUTINES TO SUIT THE LOCAL STATION SEPARATION. TESTS HAVE BEEN PERFORMED BY SIMULATING THE LAKE HIGH PATTERN WITH AN ANALYTIC FUNCTION FROM WHICH MOCK DATA ARE DERIVED AT PRESSURE-MEASURING STATIONS ACTIVE DURING IFYGL;

484 SAMOTEO, DOUGLAS D.;
DISTRIBUTION OF SOUND SCATTERING LAYERS CAUSED BY EUPHAUSIIDS AND THEIR RELATIONSHIP TO CHLOROPHYLL A CONCENTRATIONS IN THE GULF OF ST. LAWRENCE ESTUARY;
(1976) J FISHERIES RES BOARD CANADA, 411, P661-667;
ZOOPLANKTON; CHLOROPHYLL-A; BIOMASS; DISTRIBUTION;
CAN-FRS-FR6-233-4-1; GCODE7;
A 3-YR STUDY IN THE GULF OF ST. LAWRENCE ESTUARY USING A 120-KHZ SOUNDER HAS SHOWN THE EXISTENCE OF A LARGE POPULATION OF EUPHAUSIIDS CONSISTING OF THE SPECIES THYSANOESSA RASCHII, T. INERMIS, AND MEGANYCTIPHANES NORVEGICA. THE SOUND SCATTERING PRODUCED BY THESE ANIMALS VARIED IN INTENSITY AS THE DENSITY AND BIOMASS PER CUBIC METER OF THE ANIMALS. CHLOROPHYLL A CONCENTRATIONS MEASURED WITHIN 5 M OF THE SURFACE AT THE SAME TIME AS THE SOUND SCATTERING LAYERS SHOWED A SIGNIFICANT CORRELATION BETWEEN THE NUMBERS OF EUPHAUSIIDS PER CUBIC METER AND THE CONCENTRATION OF CHLOROPHYLL A PER CUBIC METER;

485 SARLES, FRANK B., JR.; SHEDD, CHARLES E.;
COLONIALS AND PATRIOTS HISTORIC PLACES COMMEMORATING OUR FOREBEARS 1733-1769;
(1964) US DEPT OF INTERIOR NATIONAL PARK SERVICES;
HISTORY; STRUCTURES; MAN; US;
BUTLER;

486 SAUNDERS, GEORGE W., JR.;
SUMMARY OF ATOMIC ENERGY COMMISSIONSSUPPORTED RESEARCH AND PROGRAMS;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP291-295;
US; ATOMIC ENERGY COMMISSION; RESEARCH; PROGRAMS;
US-FCS-P1972; GCODE6;

487 SAUNDERS, GEORGE W., JR.;
SUMMARY OF THE ERDA RESEARCH AND DEVELOPMENT PROGRAMS IN THE GREAT LAKES;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP493-496;
ERDA; US; DEVELOPMENT PLANNING; RESEARCH; PROGRAMS; ENERGY;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

488 SAVILLE, THORNDIKE;
COASTAL ENGINEERING RESEARCH PROGRAM - GREAT LAKES APPLICATIONS;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP114-119;
COASTAL ZONE; RESEARCH; US; REGULATORY AGENCY; ENGINEERING; US-FCS-P1972;
GCODE2C2; GCODE6;

489 SCHENK, JOHN L.; SHERGER, DALE A.;
THE EFFECT OF RESIDENTIAL AND COMMERCIAL-INDUSTRIAL LAND USE ON WATER QUALITY;
( ) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES USE;
WATER QUALITY; URBAN RUNOFF; DOMESTIC SEWAGE; OH; CINCINNATI; SEWERS;
IJC-LW-VOL. 1; GCODE1; GCODE2C2; GCODE3; GCODE4D3; GCODE4D4; GCODE5; GCODE6;

490 SCHENKER, ERIC;
AN ESTIMATION OF THE QUANTITATIVE IMPACT OF THE ST. LAWRENCE SEAWAY ON THE HINTERLAND'S ECONOMY;
(1970) PROC 13TH CONF GREAT LAKES RES, INTERNATIONAL ASSOC. FOR GREAT LAKES RESEARCH, PP166-186;
ECONOMICS; ST. LAWRENCE SEAWAY;
1551; IGR-C13-1970-P1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;
ECONOMISTS ARE IN AGREEMENT THAT THE OPENING OF THE ST. LAWRENCE SEAWAY FOR COMMERCIAL NAVIGATION HAS BENEFITED THE REGION'S ECONOMY. IN TERMS OF TOTAL POPULATION AND EMPLOYMENT, THE REGION HAS EXPERIENCED GROWTH SINCE 1958. THIS STUDY ANALYZES THE SEAWAY'S CONTRIBUTION TO THE REGIONAL ECONOMIC GROWTH PROCESS. THE APPROACH USED IN THE STUDY RELIES ON TOTAL EMPLOYMENT DATA, WITH A VIEW TO ISOLATING FACTORS RESPONSIBLE FOR PRODUCING CHANGES IN TOTAL EMPLOYMENT. THE ANALYSIS TAKES AS A WORKING HYPOTHESIS THAT AN INCREASE IN "NON-LOCALIZED" OR EXPORT EMPLOYMENT WILL INCREASE LOCALIZED EMPLOYMENT BY AN AMOUNT GREATER THAN THE INITIAL INCREASE. FIRST, ONE MUST CLASSIFY INDUSTRIES AS LOCALIZED (I.E., THOSE SERVING THE AREA UNDER INVESTIGATION) OR NON-LOCALIZED, AND THEN SEPARATE THEIR TOTAL EMPLOYMENT INTO LOCALIZED AND NON-LOCALIZED SECTORS. SECONDLY, A LINEAR REGRESSION IS DONE IN ORDER TO ESTIMATE THE INCOME-EMPLOYMENT MULTIPLIER IS DERIVED. THE INVESTIGATION SHOWED THAT THE EMPLOYMENT-INCOME MULTIPLIERS OF THE SIX STATES IN THE GREAT LAKES REGION COVERED BY THIS STUDY RANGED BETWEEN 1.0750 AND 2.0360. THE REVENUE EARNED AT THE LAKE PORTS FROM SEAWAY CARGO IS NON-LOCALIZED INCOME WHICH GENERATES SECONDARY INCOME AND EMPLOYMENT. APPLYING THE INCOME MULTIPLIERS TO THIS PRIMARY INCOME YIELDS AN ESTIMATE OF NEARLY $643 MILLION FOR THE TOTAL SEAWAY-CARGO GENERATED INCOME IN THE GREAT LAKES HINTERLAND. THIS IS AN APPROXIMATION OF THE PRIMARY INCOME EARNED AT THE PORTS PLUS SECONDARY INCOME DERIVED THEREFROM, BUT ONLY A PART OF THE TOTAL ECONOMIC IMPACT OF THE SEAWAY. THE SIZE OF THIS PARTIAL IMPACT LENDS SUPPORT TO THE THESIS THAT THE SEAWAY HAS HAD AN IMPORTANT POSITIVE EFFECT UPON THE ECONOMY OF THE GREAT LAKES REGION.;

491 SCHUPLER, ROBERT L.; LONG, MICHAEL T.;
ENVIRONMENTAL PLANNING IN THE GREAT LAKES - A SECOND LOOK AT ITS IMPLICATIONS FOR FISHERY RESOURCES RESEARCH;
(1970) THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, BUFFALO. 12PP;
FISHERIES; RESEARCH; PROGRAMS;
1557; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
PLANNING ACTIVITIES, CONCEPTS AND FUNCTIONS HAVE BEEN DEVELOPING AND CHANGING AT A RAPID RATE SINCE THE STATUS AND IMPLICATIONS OF COMPREHENSIVE WATER RESOURCES PLANNING TO FISH AND WILDLIFE RESEARCH AND MANAGEMENT WERE PRESENTED AT THE 1967 IAGLR MEETING. THE NUMBERS, TYPES AND PRESENT STATUS OF THE MAJOR STUDIES AND ACTIVITIES IN THE GREAT LAKES AREA ARE DESCRIBED AND THEIR FINDINGS AND IMPACTS ON FISHERY RESOURCES RESEARCH SUMMARIZED. CONCLUSIONS ARE PRESENTED AS TO THE TYPES OF INPUTS NEEDED FROM FISHERY BIOLOGISTS AND FISH RESEARCH AND MANAGEMENT PROGRAMS IN ORDER TO REMAIN RELEVANT TO THE OVERALL PLANNING PROCESS;

492 SCHUMACHER, MARTIN C.;
REPORTED RADIOACTIVE EFFLUENTS FROM POWER REACTORS ON THE GREAT LAKES;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP162-175;
EFFLUENTS; RADIOACTIVITY; NUCLEAR POWER GENERATION; DISCHARGE FLOW; NUCLEAR POWER GENERATING STATIONS;
US-FCS-P1975; GCODE2; GCODE5;

493 SCHWAB, DAVID J.;
INTERNAL FREE OSCILLATIONS IN LAKE ONTARIO;
(1977) LIMNOLOGY AND OCEANOGRAPHY. VOL. 22, NO. 4. PP. 700-708.;
BATHYMETRY; STRATIFICATION; TEMPERATURE GRADIENTS; WAVES;
6916; GCODE5;
A NUMERICAL PROCEDURE IS USED TO CALCULATE SOME OF THE INTERNAL FREE MODES OF OSCILLATION IN A TWO-LAYER MODEL OF LAKE ONTARIO, ASSUMING A UNIFORM EQUIVALENT DEPTH. THE MODES FALL INTO TWO CATEGORIES, ONE SET RESEMBLING KELVIN-TYPE WAVES AND THE OTHER RESEMBLING POINCARE-TYPE WAVES. OBSERVATIONAL EVIDENCE FROM LAKE ONTARIO AGREES QUALITATIVELY WITH THE PROPERTIES OF THESE TWO TYPES OF MODES.;

494 SCIPFMANMANC, FRANK;
ON THE FEASIBILITY OF PREDICTING LAKE ONTARIO WATER LEVELS;
(1975) NY STATE ASSEMBLY PUBLIC SERVICE LEGISLATIVE STUDIES PROGRAM, PP19;
LAKE LEVELS; WATER LEVELS; FORECASTING; MODEL STUDIES; MATHEMATICAL MODELS;
REGULATION: 7887; GCODES;
THIS REPORT DISCUSSES THE DESIRABILITY AND FEASIBILITY OF A 12 TO 18 MONTH
FORECAST OF LAKE ONTARIO WATER LEVELS. IT IS SHOWN HOW THIS TYPE OF FORECASTING
IS NECESSARY IN ORDER TO EFFECTIVELY CONTROL THE LAKE LEVEL VARIATIONS. A
FORECASTING MODEL IS EXPLAINED AND RESULTS OF CALCULATIONS USING GREAT LAKES
DATA ARE PRESENTED. THESE CALCULATIONS INDICATE THAT THIS PROCEDURE WILL WORK.;

495 SCOTT, JON T.; JEKEL, PETER; FENLON, MARK W.;
TRANSPORT IN THE BAROCLINIC COASTAL CURRENT NEAR THE SOUTH SHORE OF LAKE ONTARIO
IN EARLY SUMMER;
(1971) PROC. 14TH CONF. ON GREAT LAKES RESEARCH, PP640-653;
CURRENTS; TRANSPORT; WIND;
3044; GCODESD2; GCODESD5;
ACTUAL MEASUREMENT OF TRANSPORT WAS COMPARED TO COMPUTED BAROCLINIC GEOSTROPHIC
TRANSPORT FOR A 13 KM LONG CROSS-SECTION NORMAL TO THE SOUTH SHORE OF LAKE
ONTARIO. THE TRANSPORT WAS PREDOMINANTLY ALONG THE SHORE IN THE COASTAL CURRENT
WHICH REACHED ITS MAXIMUM DEVELOPMENT FROM 4-6 KM FROM SHORE. THE CURRENT WAS
SET UP BY A TYPICAL SUMMER STORM AND MAINTAINED BY AN EASTWARD (ALONGSHORE)
COMPONENT OF THE WIND BUT THE AMOUNT OF TRANSPORT WAS QUITE SENSITIVE TO CHANGES
IN THE WIND. ADJUSTMENT TO BAROCLINIC FLOW WAS RAPID REQUIRING PERHAPS LESS THAN
TWO DAYS. THE MEAN EASTWARD TRANSPORT IN THIS SUMMERTIME BAROCLINIC COASTAL
CURRENT MOVES AN ORDER OF MAGNITUDE MORE WATER THAN THE FLOWAGE OF THE
NIAGARA-ST. LAWRENCE RIVERS. THEREFORE, RETURN FLOW MUST OCCUR EITHER IN DEEP
WATER OR NEAR THE LAKE CENTER. THIS RETURN FLOW MAY TAKE SEVERAL FORMS AND IS
PROBABLY BAROTROPIC;

496 SCOTT, JON T.; LANDSBERG, DENNIS R.;
JULY CURRENTS NEAR THE SOUTH SHORE OF LAKE ONTARIO;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP705-722;
CURRENTS; VOLUME AND CURRENT FLOW; COASTAL ZONE;
3046; GCODESD2; GCODESD3; GCODESD5;
DROGUE MEASUREMENTS OF CURRENT SPEED AND DIRECTION AT FIVE ANCHORED BUOYS NEAR
THE SOUTH SHORE OF LAKE ONTARIO FROM 12 TO 20 JULY 1966 NEAR FAIRHAVEN, N.Y.
SHOWED THAT TOTAL TRANSPORT IN THE 35 M LAYER WAS NORTHEASTWARD ALONG THE SHORE.
HOWEVER, AT STATIONS 1 AND 2 KM FROM SHORE THERE WAS A SOUTHWESTWARD FLOWING
"COUNTERCURRENT." THE MAXIMUM NORTHEASTWARD "COASTAL JET" WAS NORMALLY LOCATED
AT 6 TO 10 KM SHORE. BAROCLINIC GEOSTROPHIC TRANSPORT WAS COMPUTED FROM DAILY
TEMPERATURE SOUNDINGS AT 10 STATIONS. INTERNAL WAVES AND WIND FLUCTUATIONS DID
NOT MASK THE BAROCLINIC GEOSTROPHIC FLOW FOR THIS NEARSHORE CASE. BAROCLINIC
GEOSTROPHIC FLOW AND TOTAL TRANSPORT WERE TO THE NORTHEAST IN THE SURFACE
LAYERS, BUT THE ANALYSIS INDICATED THERE WAS A SLOW RETURN FLOW OPPOSED TO
THESE. TRANSPORT IN DEEP WATER WAS, THEREFORE, SOUTHWESTWARD. THE BAROCLINIC
GEOSTROPHIC COMPUTATION IS A GOOD PREDICTOR OF SURFACE CURRENTS IN SUMMER WHEN
THE LATTER ARE MUCH LARGER THAN THE STEADY RETURN BAROTROPIC FLOW;

497 SEIBEL, ERWIN; ARMSTRONG, JOHN M.; ALEXANDER, CHERYL L.;
TECHNICAL REPORT ON DETERMINATION OF QUANTITY AND QUALITY OF GREAT LAKES U.S.
SHORELINE ERODED MATERIAL;
(1976) IJC. INTERNATIONAL REFERENCE GROUP ON GREAT LAKES POLLUTION FROM LAND USE
ACTIVITIES. 242PP;
EROSION; BLUFFS; WAVES; WIND; STORM SURGE; LITTORAL; CURRENTS; LAKE LEVELS;
PHOSPHORUS, NITROGEN; CALCIUM; MAGNESIUM; SODIUM; IRON; MANGANESE; ALUMINUM;
BORON; BARIUM; COPPER; LEAD; ZINC; VANADIUM; CARBON;
IJC-LLU; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

498 SEYFRIED, PATRICIA L.;
SAMPLING BACTERIA IN LAKE ONTARIO AND THE TORONTO HARBOUR;
(1973) PROC 16TH CONF GREAT LAKES RES, P163-182;
BACTERIA; CLIMATIC FACTORS; FECAL COLIFORMS; ABUNDANCE;
ICP-C16-1973; GCODESA1; GCODESA3; GCODES,

THE SURVEY OF HETEROTROPHIC ORGANISMS AND POLLUTION-INDICATING BACTERIA IN LAKE ONTARIO AND THE TORONTO HARBOUR WAS CARRIED OUT DURING JUNE, JULY AND AUGUST 1971-72. TRIPLICATE WATER SAMPLES WERE COLLECTED FROM A 1-FOOT DEPTH AT 3-HOUR INTERVALS OVER A 24-HOUR PERIOD. THE OBJECTIVES OF THE STUDY WERE TO INVESTIGATE BACTERIA CYCLES AND DETERMINE IF THERE IS ANY CORRELATION BETWEEN THE PRESENCE OF CERTAIN AQUATIC GENERA AND THE NUMBERS OF COLIFORMS IN POLLUTED WATER. TORONTO HARBOUR WAS FOUND TO HAVE A SIGNIFICANTLY HIGHER COUNT OF COLIFORMS, FECAL COLIFORMS AND FECAL STREPTOCOCCI THAN LAKE ONTARIO. ALSO THE GENERIC DISTRIBUTION OF HETEROTROPHIC BACTERIA IN THE 2 BODIES OF WATER DIFFERED CONSIDERABLY. ACINETOBACTER, WHICH MADE UP APPROXIMATELY 1/2 OF THE TOTAL BACTERIAL POPULATION, WAS THE PREDOMINANT GENUS IN THE HARBOUR. AEROMONAS, PSEUDOMONAS, FLAVOBACTERIUM AND ACHROMOBACTER SPECIES WERE ALSO PREVALENT, ALTHOUGH TO A MUCH LESSER DEGREE. SOME ACINETOBACTER WERE EVIDENT IN LAKE ONTARIO, BUT THERE TENDED TO BE A MORE EVEN DISTRIBUTION OF MEMBERS OF THE FAMILY ENTEROBACTERIACEAE AND OF THE GENERA FLAVOBACTERIUM, PSEUDOMONAS, ACHROMOBACTER AND AEROMONAS. THE RESULTS SHOWED THAT ON CLEAR, SUNNY DAYS THE BACTERIAL COUNTS FROM BOTH THE HARBOUR AND LAKE ONTARIO BEGAN TO DECREASE AT 1200 AND REACHED A LOW POINT AT 1500. THIS EFFECT WAS NOT NOTICED IF THERE WAS A HEAVY CLOUD COVER OR IF THE AIR POLLUTION COUNT WAS HIGH. STATISTICAL ANALYSES REVEALED THAT THE COUNTS FROM SAMPLES COLLECTED AT 1500 ON A NORMAL SUNNY DAY WERE SIGNIFICANTLY DIFFERENT FROM COUNTS TAKEN AT ANY OTHER HOUR;

499 SHARMA, RAJENDRA K.; FREEMAN, RICHARD F.;
SURVEY OF FISH IMPINGEMENT AT POWER PLANTS IN THE UNITED STATES. VOLUME I: THE GREAT LAKES;
(1977) ARGONNE NATIONAL LABORATORY. PP. 218;
FISH; WATER; WATER INTAKES; IMPACT; AQUATIC SYSTEMS; IMPINGEMENT; NUCLEAR POWER GENERATING STATIONS; ELECTRIC POWER GENERATING STATIONS; CHEMISTRY; BIOLOGY; PHYSIOGRAPHY; CURRENTS; TEMPERATURE;
ANL/ES-56-V.1, GCODE2; GCODE3; GCODE5; GCODE6;
IMPINGEMENT OF FISH AT COOLING-WATER INTAKES HAS BEEN SURVEYED AND DATA ARE PRESENTED. DESCRIPTIONS OF SITE, PLANT, AND INTAKE DESIGN AND OPERATION ARE PROVIDED. REPORTS IN THIS VOLUME SUMMARIZE IMPINGEMENT DATA FOR INDIVIDUAL PLANTS IN TABULAR AND HISTOGRAM FORMATS. INFORMATION WAS AVAILABLE FROM DIFFERING SOURCES SUCH AS THE UTILITIES THEMSELVES, PUBLIC DOCUMENTS, REGULATORY AGENCIES, AND OTHERS. THUS, THE EXTENT OF DETAIL IN THE REPORTS VARIES GREATLY FROM PLANT TO PLANT. HISTOGRAM PREPARATION INVOLVED AN EXTRAPOLATION PROCEDURE THAT HAS INADEQUACIES. THE READER IS CAUTIONED IN THE USE OF INFORMATION PRESENTED IN THIS VOLUME TO DETERMINE INTAKE-DESIGN ACCEPTABILITY OR INTENSITY OF IMPACTS ON ECOSYSTEMS. NO CONCLUSIONS ARE PRESENTED HEREIN; DATA COMPARISONS ARE MADE IN VOLUME IV.;

500 SHEARER, ROBERT I;
AN INVESTIGATION OF THE VERTICAL DISTRIBUTION OF THE MEIOBENTHOS OF LITTLE SODUS BAY;
(1974) RICE CREEK BIOLOGICAL FIELD STATION BULLETIN, 1(1):59-65;
ZOOPLANKTON; CRUSTACEA; DISTRIBUTION; BENTHOS; SAMPLE COLLECTION; METHODS; EQUIPMENT;
NY-OOS-B1974-1; GCODE5C3;

501 SHIOMI, MICHAEL T.; KUNTZ, KENNETH W.;
GREAT LAKES PRECIPITATION CHEMISTRY: PART 1. LAKE ONTARIO BASIN;
(1973) PROC 16TH CONF GREAT LAKES RES, P581-6(2);
CHEMICAL COMPOSITION; PRECIPITATION; CHEMICAL LOADING; HEAVY METALS; NITROGEN; NUTRIENT LOADING; PHOSPHORUS; SODIUM; CALCIUM; MAGNESIUM; LEAD; POTASSIUM; CHLORIDE; SULPHATE; ZINC; COPPER; CADMIUM; IRON;
IGR-C16-1973; CAN-CCIW-CR-6; GCODE5;
THE CHEMICAL COMPOSITION OF BULK PRECIPITATION IN THE LAKE ONTARIO BASIN HAS BEEN STUDIED TO DETERMINE ITS POTENTIAL CONTRIBUTION TO THE CHEMICAL BUDGETS OF THE LAKE AND TO PROVIDE BASIC BACKGROUND DATA AS A BASELINE FOR LATER COMPARISONS. THE RESULTS FROM 7 SAMPLING STATIONS DURING THE 2-YR PERIOD 1970-71 ARE PRESENTED. THE RESULTS SUGGEST THAT BULK PRECIPITATION MAY BE A SIGNIFICANT SOURCE OF NITROGEN AND PHOSPHORUS TO THE LAKE, WITH THE NITROGEN INPUT ESTIMATED AT 12-14% OF THE TOTAL FROM OTHER SOURCES AND THE PHOSPHORUS INPUT FROM 5 TO

14%. THE BULK PRECIPITATION LOADINGS OF THE MAJOR IONS SODIUM, POTASSIUM, CALCIUM, MAGNESIUM, CHLORIDE AND SULPHATE TO THE LAKE WERE FOUND TO BE LESS THAN 3% OF ESTIMATED NIAGARA RIVER LOADINGS OF THE SAME PARAMETERS. COMPARISONS OF LAKE SURFACE LOADINGS OF HEAVY METALS BY BULK PRECIPITATION IN THE LAKE ONTARIO BASIN WITH ESTIMATED NIAGARA RIVER LOADINGS HAVE SHOWN THAT BULK PRECIPITATION MAY BE A SIGNIFICANT SOURCE OF LEAD AND ZINC TO THE LAKE. BULK PRECIPITATION LOADINGS WERE FOUND TO BE FROM 15 TO 36% AND FROM 58 TO 85% OF THE ESTIMATED NIAGARA RIVER LOADINGS FOR LEAD AND ZINC, RESPECTIVELY;

502 SIMONS, THEODORE J.;
ANALYSIS AND SIMULATION OF SPATIAL VARIATIONS OF PHYSICAL AND BIOCHEMICAL PROCESSES IN LAKE ONTARIO;
(1976) JOURNAL OF GREAT LAKES RESEARCH, VOL. 2, NO. 2, PP. 215-233;
ANALYSIS; MATHEMATICAL MODELS; BIOCHEMICAL ENVIRONMENT; MODEL STUDIES; AQUATIC SYSTEMS;
GCODE5; 5393;
NUMERICAL TECHNIQUES ARE EMPLOYED TO INVESTIGATE EFFECTS OF LARGE-SCALE WATER TRANSPORTS, VERTICAL MIXING MECHANISMS, AND SPATIAL VARIATIONS IN ENVIRONMENTAL CONDITIONS IN RELATION TO BIOCHEMICAL PROCESSES IN A LARGE LAKE. THE INVESTIGATION UTILIZES THE DATA BASE ACCUMULATED DURING THE 1972 INTERNATIONAL FIELD YEAR ON LAKE ONTARIO TO ARRIVE AT QUANTITATIVE ESTIMATES OF THESE EFFECTS.THE LAKE IS SEGMENTED INTO 2? ZONES AND 4 LAYERS ON THE BASIS OF BATHYMETRIC AND THERMODYNAMIC CONSIDERATIONS. A HYDRODYNAMIC MODEL OF MUCH GREATER HORIZONTAL RESOLUTION IS USED TO COMPUTE WATER CIRCULATIONS IN LAKE ONTARIO FROM APRIL THROUGH NOVEMBER, 1972. HEAT BUDGETS AND TEMPERATURES DERIVED FROM WEEKLY SHIP SURVEYS PERMIT CALCULATION OF VERTICAL MIXING PROCESSES, WHEREAS CHEMICAL BUDGETS YIELD SEDIMENTATION ESTIMATES. PRIMARY PRODUCTION MEASUREMENTS TOGETHER WITH SOLAR RADIATION AND LIGHT EXTINCTION DATA ARE ANALYZED TO FORMULATE PHOTOSYNTHESIS AS A FUNCTION OF ENVIRONMENTAL CONDITIONS. A SIMPLE NUTRIENT-PLANKTON INTERACTION MODEL, PREVIOUSLY VALIDATED FOR LAKE ONTARIO, IS BORROWED TO EVALUATE ITS SENSITIVITY TO REALISTIC TRANSPORT AND MIXING PROCESSES. IT IS CONCLUDED THAT A HORIZONTALLY-MIXED MODEL REPRODUCES THE ESSENTIAL FEATURES OF LAKE-WIDE AVERAGED SOLUTIONS DERIVED FROM A SEGMENTED LAKE. EFFECTS OF WATER TRANSPORTS ARE FOUND TO BE COMPARABLE IN MAGNITUDE TO OTHER PHYSICAL PROCESSES, THUS IMPLYING THAT A SEGMENTED WATER QUALITY MODEL MUST INCORPORATE A WATER CIRCULATION MODEL.;

503 SKIFF, J. V.; WEEKS, D. H.; STONE, UDELL B.;
LAKE ONTARIO;
(1950) NY STATE CONSERVATIONIST 4(4), 17-16;
FISH; COMMERCIAL FISHERIES; CREEL;
4194; GCODE5;

504 SKOCH, EDWIN J.;
CHANGES IN THE SEDIMENT CHEMISTRY OF LAKES ERIE AND ONTARIO;
(1971) BULLETIN OF BUFFALO SOCIETY OF NATURAL SCIENCES, V. 25, NO. 2, PP. 67-76.;
SEDIMENT; CHEMICAL COMPOSITION;
BUF-BSNS-BULL-25(2); GCODE4; GCODE5;

505 SLY, PETER G.;
A REPORT ON STUDIES OF THE EFFECTS OF DREDGING AND DISPOSAL IN THE GREAT LAKES WITH EMPHASIS ON CANADIAN WATER;
(1977) CANADA CENTRE FOR INLAND WATERS. SCIENTIFIC SERIES NO. 77.38PP;
DREDGING; WATER QUALITY, DREDGE DISPOSAL; RESEARCH; SEDIMENT; NUTRIENTS; TEMPERATURE; HEAVY METALS; NAVIGATION;
CAN-EN36-502/77; GCODE1; GCODE1C2; GCODE1E1; GCODE1E2; GCODE2; GCODE3; GCODE4; GCODE4A5; GCODE4C2; GCODE5; GCODE5A2; GCODE6;
THIS REPORT REFERS PRINCIPALLY TO STUDIES IN THE CANADIAN PORTION OF THE GREAT LAKES WHICH, IN MOST CASES, HAVE BEEN UNDERTAKEN IN CONJUNCTION WITH REGULAR DREDGING OPERATIONS. AT PORT STANLEY (LAKE ERIE) AND BRONTE HARBOUR (LAKE ONTARIO), IN STUDIES BEFORE, DURING AND AFTER MAINTENANCE DREDGING IT WAS SHOWN THAT TOTAL AND REACTIVE PHOSPHORUS LEVELS INCREASED RAPIDLY IN THE RECEIVING WATERS BOTH AT THE REMOVAL SITE AND AT THE OPEN-LAKE DUMPING SITE; SIMILAR

INCREASES IN OTHER NUTRIENT ELEMENTS AND HEAVY METALS WERE ALSO OBSERVED. HOWEVER, AS A RESULT OF PARTICLE SETTLING AND DILUTION, ELEVATED CONCENTRATIONS DECREASED RAPIDLY AND BACKGROUND CONDITIONS IN THE OVERLYING WATERS WERE GENERALLY RE-ESTABLISHED WITHIN A FEW HOURS. BECAUSE OF THE INFLUENCE OF WAVE ACTIVITY IN LAKE ERIE THE DUMPED MATERIALS WERE RAPIDLY REDISTRIBUTED AND NO EVIDENCE WAS OBTAINED TO INDICATE A LONG TERM INFLUENCE ON WATER CHEMISTRY. AT THUNDER BAY (LAKE SUPERIOR), HOWEVER, RECENT EVIDENCE SUGGESTS THAT SOME HARBOUR MATERIALS DISPOSED OF IN DEEP WATER, BELOW WAVE BASE, MAY CONTINUE TO INFLUENCE OVERLYING WATERS FOR EXTENDED PERIODS. AT MITCHELL BAY (LAKE ST. CLAIR), CONTAINMENT OF DREDGED MATERIALS IN AN ARTIFICIAL ISLAND WAS EXAMINED, PARTICULARLY TO ASSESS THE SIGNIFICANCE OF SEDIMENT WATER EXCHANGE PROCESSES. TESTS WERE MADE BOTH UPON PUMPED SLURRY AND ON DUMPED MATERIALS AFTER SETTLEMENT. DESPITE SEASONAL VARIATIONS IN SURFACE MATERIALS PORE WATER CONCENTRATIONS BELOW ABOUT 1.5M REMAINED SENSIBLY CONSTANT; CONCENTRATIONS OF AL, CD, CU, PB AND ZN WERE SIMILAR AND CONCENTRATION PROFILES OF FE, MN AND P SHOWED STRONG DEPENDENCE UPON PH AND REDOX POTENTIAL; HG IN PORE WATER REMAINED INDEPENDENT OF SEDIMENT VALUES. DREDGING EFFECTS AND SHIP TURBULENCE ARE UNDOUBTEDLY SIGNIFICANT CONTRIBUTORS TO LOCAL SEDIMENT/WATER MIXING; IN THE GREAT LAKES, HOWEVER, THE IMPORTANCE OF THESE EVENTS REMAINS SMALL IN COMPARISON TO LAKE-WIDE EFFECTS SUCH AS THE RESUSPENSION OF SEDIMENTS AS A RESULT OF WIND-WAVE ACTION. BASED UPON DATA FROM FIELD EXPERIMENTS AND OBSERVATIONS ASSOCIATED WITH THE DREDGING/DUMPING ACTIVITIES, UPON DATA FROM LABORATORY STUDIES AND UPON DATA AVAILABLE IN OTHER PUBLISHED WORKS, THE SIGNIFICANCE OF ENVIRONMENTAL IMPACT IN TERMS OF THE BEHAVIOR OF NUTRIENT AND MOBILE ELEMENTS, TOXIC SUBSTANCES AND HEAVY METALS, AND SEDIMENT/WATER MIXING HAVE BEEN DRAFTED IN THE FORM OF CONCLUSIONS;

506 SLY, PETER G.;
SEDIMENTOLOGICAL STUDIES IN THE NIAGARA AREA OF LAKE ONTARIO, AND IN THE AREA IMMEDIATELY NORTH OF THE BRUCE PENINSULA IN GEORGIAN BAY;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP341-346;
BOTTOM; SEDIMENT; SEDIMENTATION GEOLOGY

1604; GCODE3G3; GCODE3G5; GCODE5A4; GCODE5C;
A STUDY OF THE BOTTOM SAMPLE VARIANCE IN DIFFERENT ENVIRONMENTS IN THE GREAT LAKES WAS BEGUN IN 1967. BY THE END OF 1969 TWO AREAS WILL HAVE BEEN COMPLETELY SURVEYED; ONE AROUND THE NIAGARA RIVER MOUTH IN LAKE ONTARIO, AND THE OTHER IN GEORGIAN BAY, NEAR THE TIP OF THE BRUCE PENINSULA. A PRELIMINARY STUDY OF A THIRD AREA IN LAKE ONTARIO NEAR KINGSTON, IS TO BEGIN IN 1969. A SPECIAL SAMPLING GRID, COVERING AN AREA OF ABOUT 150 SQUARE KMS HAS BEEN DEVISED FOR USE IN ALL THE STUDY AREAS AND SAMPLING HAS BEEN DESIGNED TO YIELD MATERIAL FOR SEDIMENTOLOGICAL, GEOCHEMICAL AND BIOLOGICAL STUDIES. UNDERWATER PHOTOGRAPHY HAS BEEN USED TO PROVIDE VISUAL RECORDS OF THE LAKE BOTTOM. ECHO SOUNDING, SIDE SCAN SONAR, AND CONTINUOUS SEISMIC PROFILING HAS BEEN USED TO OBTAIN SUB-BOTTOM PENETRATION AND COMPLETE PHYSIOGRAPHIC COVERAGE;

507 SMITH, BERNARD R.; BRAEM, ROBERT A.;
LAMPREY CONTROL IN THE UNITED STATES;
(1972) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1970, APPENDIX C, P30-42;
PETROMYZON MARINUS; CONTROL; LAMPRICIDES; ELECTRICAL LAMPREY BARRIERS; MIGRATION;
GLF-AR-1970; GCODE1; GCODE2; GCODE3; GCODE5;

508 SMITH, BERNARD R.; BRAEM, ROBERT A.;
LAMPREY CONTROL IN THE UNITED STATES;
(1973) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1972, APPENDIX C, P42-59;
PETROMYZON MARINUS; LAMPRICIDES; CONTROL; MIGRATION;
GLF-AR-1972; GCODE1; GCODE2; GCODE3; GCODE5;

509 SMITH, HUGH M; SNELL, MERWIN-MARIE;
THE FISHERIES OF LAKE ONTARIO;
(1890) SMITH, HUGH M AND MERWIN-MARIE SNELL, REVIEW OF THE FISHERIES OF THE

GREAT LAKES IN 1885, CHAPTER VIII, P250-326;
FISH; FISHERIES; COMMERCIAL FISHERIES; FISHING GROUNDS; HISTORY; NETS;
8C33; GCODE5;

510 SMITH, STANFORD H.;
APPLICATION OF THEORY AND RESEARCH IN FISHERY MANAGEMENT OF THE LAURENTIAN GREAT LAKES;
(1973) TRANS AM FISHERIES SOC 102(1):156-163;
RESEARCH; FISHERIES; MANAGEMENT; HISTORY; PETROMYZON MARINUS;
7695; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE GREAT LAKES HAVE A HIGH POTENTIAL FOR THE CONDUCT OF RESEARCH AND USEFUL APPLICATION OF RESEARCH FINDINGS, BUT THE HISTORY OF THE GREAT LAKES INDICATES THAT EXTENSIVE RESEARCH AND INTENSIVE MANAGEMENT HAVE FAILED TO PREVENT DETERIORATION OF THE FISHERIES. AT TIMES THE RESEARCH WAS NOT DONE BEFORE A LOSS OCCURRED, OR DID NOT PROVIDE THE INFORMATION NEEDED TO SOLVE A PROBLEM, OR WAS NOT INTERPRETED TO INDICATE A NEED FOR CORRECTIVE ACTION. SUCCESSFUL APPLICATION OF THEORY AND RESEARCH TO FISHERY MANAGEMENT HAS ALWAYS BEEN IMPEDED BY LACK OF CONTINUED AND CLOSE COORDINATION AMONG SOME 30-40 STATE, PROVINCIAL, AND FEDERAL GOVERNMENTAL UNITS THAT HAVE VARYING DEGREES OF INFLUENCE ON FISHERY PROGRESS OF THE GREAT LAKES. FREQUENTLY AGREEMENTS THAT HAVE BEEN REACHED AMONG CONSERVATION AGENCIES WERE NOT SUSTAINED BY LEGISLATIVE UNITS, OR WERE NULLIFIED BY ORGANIZATIONAL CHANGES. AS A RESULT, CONFLICTING APPROACHES WERE SOMETIMES TAKEN BY MANAGEMENT AGENCIES WITH JURISDICTION IN DIFFERENT AREAS OF THE SAME LAKE. SUSTAINED AND COMPATABLE MANAGEMENT OBJECTIVES AND PRACTICES CAN, HOWEVER, CONTRIBUTE TO GREATER STABILITY, AND OPTIMUM USEFULNESS AND PRODUCTIVITY.;

511 SMITH, STANFORD H.;
HISTORIC INFORMATION ON GREAT LAKES FISH;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P109-114;
FISH; HISTORY;
IJC-RA7; GCODE6;

512 SMITH, STANFORD H.;
RESEARCH GRANTS FOR FISHERIES OF THE GREAT LAKES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP220-224;
RESEARCH; FISHERIES; NOAA; US; REGULATORY AGENCY;
US-FCS-F1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

513 SMITH, STANFORD H.;
SPECIES INTERACTIONS OF THE ALEWIFE IN THE GREAT LAKES;
(1970) TRANSACTIONS OF THE AMERICAN FISHERIES SOCIETY. VOL. 99. NO. 4. PP754-765;
ALOSA PSEUDOHARENGUS; FISHERIES; FISH; HISTORY; ABUNDANCE; DISTRIBUTION;
2196; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
THE ALEWIFE (ALOSA PSEUDOHARENGUS) HAS CAUSED SERIOUS PROBLEMS IN THE GREAT LAKES FOR ALMOST 100 YEARS. IT ENTERED LAKE ONTARIO IN ABUNDANCE VIA THE ERIE CANAL DURING THE 1860'S WHEN MAJOR PISCIVORES WERE DECLINING, AND BECAME THE DOMINANT SPECIES IN THE LAKE DURING THE 1870'S. THE ALEWIFE SUBSEQUENTLY SPREAD THROUGHOUT THE GREAT LAKES AND BECAME THE DOMINANT SPECIES IN LAKES HURON AND MICHIGAN AS MAJOR PISCIVORES DECLINED. IN LAKES WHERE IT BECAME EXTREMELY ABUNDANT, THE SHALLOW-WATER PLANKTIVORES DECLINED IN THE FIRST DECADE AFTER ALEWIFE ESTABLISHMENT, THE MINOR PISCIVORES INCREASED THEN DECLINED IN THE SECOND DECADE, AND THE DEEP-WATER PLANKTIVORES DECLINED IN THE THIRD DECADE. THE CONSEQUENCE HAS BEEN A GENERAL REDUCTION IN FISHERY PRODUCTIVITY. REHABILITATION WILL REQUIRE EXTREME REDUCTION OF THE ALEWIFE, AND RESTORATION OF AN INTERACTING COMPLEX OF DEEP- AND SHALLOW-WATER FORAGE SPECIES, AND MINOR AND MAJOR PISCIVORES, EITHER BY REESTABLISHING SPECIES AFFECTED BY THE ALEWIFE, OR BY THE INTRODUCTION OF NEW SPECIES THAT CAN THRIVE UNDER THE NEW ECOLOGICAL CONDITIONS OF THE LAKES;

514 SMITH, STANFORD H.;
TRENDS IN FISHERY MANAGEMENT OF THE GREAT LAKES;
(1970) BENSON, NORMAN G., EDITOR, A CENTURY OF FISHERIES IN NORTH AMERICA.

AMERICAN FISHERY SOCIETY SPECIAL PUBLICATION NO. 7. PP107-124;
FISH; FISHERIES; MANAGEMENT; HISTORY; FISH STOCKING; COREGONUS CLUPEAFORMIS;
LEUCICHTHYS ARTEDI; STIZOSTEDION VITREUM; ACIPENSERIDAE; PETROMYZON MARINUS;
SALVELINUS NAMAYCUSH; LOTA LOTA; CATOSTOMUS; LEUCICHTHYS HOYI; ALOSA
PSEUDOHARENGUS; NOTROPIS ATHERINOIDES; PERCA FLAVESCENS; OSMERUS; APLODINOTUS
GRUNNIENS; CYPRINUS ; CARASSIUS AURATUS;
224C; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

515 SMITH, STANFORD H.; BUETTNER, HOWARD J.; HILE, RALPH;
FISHERY STATISTICAL DISTRICTS OF THE GREAT LAKES;
(1961) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 2.;
FISHERIES; STATISTICS;
GLF-TR2; GCODE1; GCODE2; GCODE3; GCODE4; GCODE4A2; GCODE4A3; GCODE4A5; GCODE5;
GCODE6;

516 SMYTH, PATRICK J.; ALFSCHLAGER, FRED; KING, DONALD S.; MOOERS, RICHARD E.;
QUINN, DOUGLAS H.;
REGIONAL LAND USE PLAN;
(1977) BLACK RIVER-ST. LAWRENCE REGIONAL PLANNING BOARD COMPREHENSIVE PLANNING
SERIES REPORT NO. 11, 134P, MAP;
LAND USE; DEVELOPMENT PLANNING; RECREATION; METEOROLOGY; POPULATION DYNAMICS;
BSRP-C11; GCODE5D4; GCODE5D5; GCODE7;
UTILIZING DATA FROM A VARIETY OF SOURCES AND BASED ON SEVERAL YEARS OF STUDY,
THIS REPORT DESCRIBES A LAND USE PLAN FOR A NON-METROPOLITAN REGION.
PREDOMINANTLY RESOURCE ORIENTED, THE PLAN NONE-THE-LESS COVERS AN URBANIZATION
PROCESS ADDRESSING SLIGHT GROWTH WITH SLIGHT CONCENTRATION RELATIVE TO
POPULATION AND ECONOMIC ACTIVITY. THOUGH ONLY ONE ELEMENT OF A COMPREHENSIVE
PLAN THE DOCUMENT COVERS TRADITIONAL PLANNING ELEMENTS OF DEMOGRAPHY,
TRANSPORTATION, RECREATION AND COMMUNITY FACILITIES. THE MAP PATTERN IS
EXPLAINED IN THE TEXT BY MEANS OF RIGOROUS DEFINITION AND PROCESS METHODOLOGY;

517 SONZOGNI, WILLIAM C.; SHAFER, CHRIS A.; CROOK, LEONARD T.;
OVERVIEW OF FEDERAL ENERGY-RELATED RESEARCH PROGRAMS IN THE GREAT LAKES AREA;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP468-479;
ENERGY; RESEARCH; US; GLBC; REGULATORY AGENCY;
US-FCS-P1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

518 SPAFFORD, ROBERT A;
THE DISTRIBUTION OF MICROCRUSTACEANS AT THE MUD-WATER INTERFACE OF LITTLE SODUS
BAY;
(1974) RICE CREEK BIOLOGICAL FIELD STATION BULLETIN, 1(1)32-44;
ZOOPLANKTON; SAMPLE COLLECTION; METHODS; EQUIPMENT; BOTTOM; CRUSTACEA; DISSOLVED
OXYGEN;
NY-OOS-B2974-1; GCODE5D3;

519 SPAGNOLI, JOHN J.; SKINNER, LAWRENCE C.;
PCB'S IN FISH FROM SELECTED WATERS OF NEW YORK STATE;
(1977) PESTICIDES MONITORING JOURNAL, VOL. 11, NO. 2. PP. 69-87.;
NY; HUDSON RIVER; CAYUGA LAKE; ONONDAGA LAKE; PCB; FISH; MICROPTERUS;
STIZOSTEDION; CATOSTOMUS; ONCORHYNCHUS; ICTALURUS; CYPRINUS; CARASSIUS AURATUS;
SALVELINUS NAMAYCUSH; SALMO GAIRDNERI;
7CH1; GCODE5;
PCB RESIDUES IN FISH FROM 4. STATIONS THROUGHOUT NEW YORK STATE WERE MONITORED
IN 1975. NEARLY ALL FISH CONTAINED PCB'S IN DETECTABLE AMOUNTS ALTHOUGH THE
LEVELS OF CONTAMINATION AND SPECIFIC AROCLOR VARIED. THE HUDSON RIVER CONTAINED
THE HIGHEST KNOWN PCB CONCENTRATIONS WITHIN THE UNITED STATES: LEVELS OFTEN
EXCEEDED 100 PPM. OTHER WATERS AND FISH WHICH WERE SIGNIFICANTLY CONTAMINATED
INCLUDE LAKE ONTARIO SALMONIDS AND CAYUGA LAKE LAKE TROUT. ONONDAGA LAKE,
PREVIOUSLY CLOSED TO FISHING BECAUSE OF MERCURY CONTAMINATION ALSO APPEARS TO
HAVE ABNORMALLY HIGH LEVELS OF PCB'S APPROACHING IN SOME INSTANCES THE ACTION
LEVEL OF THE FOOD AND DRUG ADMINISTRATION, U.S. DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE. SAMPLES FROM MARINE WATERS GENERALLY HAVE CONTAMINANT LEVELS
SUBSTANTIALLY BELOW 5.0 PPM.;

520 SRIDHARAN, NAGALAXMI; LEE, G FRED;
ALGAL NUTRIENT LIMITATION IN LAKE ONTARIO AND TRIBUTARY WATERS;
(1977) WATER RESEARCH 11(10):645-658;
ALGAE; NUTRIENTS; CONTROL; GROWTH; PHOSPHORUS; EUTROPHICATION; PHYTOPLANKTON;
NITROGEN;
7500; GCODE5A4T3; GCODE5C2T5; GCODE5D4T1; GCODE5D3T4;
TO DETERMINE THE POSSIBLE LIMITING NUTRIENT FOR PLANKTONIC ALGAL GROWTH IN LAKE ONTARIO A NUTRIENT ENRICHMENT STUDY WAS CONDUCTED DURING 1972-1973 AS PART OF IFYGL. THE STUDY INCLUDED THE MEASUREMENTS OF THE GROWTH RESPONSE OF LABORATORY-GROWN AND NATURAL ALGAE IN NUTRIENT ENRICHED LAKE ONTARIO WATER AND TRIBUTARY WATERS.;

521 STEGGLES, WILLIAM A.;
ORGANIZATION AND PLANNING OF WATER QUALITY CONTROL;
(1968) PROC GREAT LAKES WATER RESOURCES CONF, PP447-470;
WATER QUALITY; CONTROL; REGULATION; CHLORIDE; NUTRIENTS; PHOSPHORUS;
CAN-EIC-1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
16 MILLION PEOPLE, THEIR LIVESTOCK AND INDUSTRY POLLUTE THE WATERS OF LAKE ONTARIO AND LAKE ERIE. THE NATURAL LONG TERM QUALITY CHANGES OF THE LAKES HAVE BEEN ACCELERATED BY THE BUILDUP OF MINERAL NUTRIENTS AND ALGAE WITH FAR-REACHING CONSEQUENCES FOR THE WATER USERS OF THE LAKES. WHILE WASTE DISPOSAL IS ESSENTIAL FOR LIFE AND INDUSTRY, IT MUST BE DONE IN SUCH A WAY THAT THE HIGHEST POSSIBLE WATER QUALITY IS ACHIEVED. THE NEED EXISTS FOR COMPREHENSIVE MANAGEMENT CAPABLE OF INTEGRATING, PLANNING, IMPLEMENTING, AND MAINTAINING CONTROL OVER WATER QUALITY IN THE GREAT LAKES AND THEIR TRIBUTARY STREAMS TO ACHIEVE THE QUALITY NEEDED FOR THE MULTIPLE USES OF WATER. IMPROVED METHODS AND SYSTEMS ARE NOW AVAILABLE TO MANAGEMENT TO OBTAIN THIS OBJECTIVE. CONTROL OF NUTRIENTS FROM A VARIETY OF SOURCES IS REQUIRED. METHODS ARE AVAILABLE TO IDENTIFY CRITICAL NUTRIENTS AND MAKE A START ON CONTROLLING THE INPUT OF PHOSPHORUS TO THE LAKES. THE PARALLEL DEVELOPMENT AND IMPLEMENTATION OF WATER QUALITY OBJECTIVES OR STANDARDS IN THE GREAT LAKES STATES AND ONTARIO PROVIDES FOR COMPREHENSIVE DRAINAGE BASIN PLANNING AND POLLUTION CONTROL. EXAMPLES OF MEASURES IN THE UNITED STATES AND GERMANY ARE COMPARED WITH WATER QUALITY PROGRAMS IN ONTARIO.;

522 STEVENSON, R. JAN, STOERMER, EUGENE F.;
DIATOMS FROM THE GREAT LAKES. II. SOME RARE OR POORLY KNOWN SPECIES OF THE GENUS NAVICULA;
(1978) J GREAT LAKES RES 4(2):178-185;
BACILLARIOPHYCEAE; ALGAE; PHYTOPLANKTON; NAVICULA;
7800; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
21 TAXA OF THE DIATOM GENUS NAVICULA WHICH ARE KNOWN TO OCCUR IN THE GREAT LAKES BUT HAVE NOT BEEN ADEQUATELY TREATED IN THE NORTH AMERICAN LITERATURE ARE DESCRIBED AND FIGURED. THE OBSERVED GREAT LAKES DISTRIBUTION AND ECOLOGICAL AFFINITIES OF THESE ENTITIES ARE DISCUSSED.;

523 STIEFEL, ROBERT C.; NEMETH, ZOLTAN A.; WALDRUP, ACIE C.;
TRANSPORTATION AREAS;
(1974) IN: IJC MANAGEMENT PROGRAMS, RESEARCH AND EFFECTS OF PRESENT LAND USE ACTIVITIES ON WATER QUALITY OF GREAT LAKES VOLUME 1, 27PP;
TRANSPORTATION; LAND USE; WATER QUALITY; WATER; POLLUTION; HERBICIDES; ROAD SALT; HEAVY METALS; CHEMICAL LOADING; RESEARCH; CONTROL;
GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

524 STOERMER, EUGENE F.;
ANALYSIS OF PHYTOPLANKTON COMPOSITION AND ABUNDANCE DURING IFYGL;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP90-109;
PHYTOPLANKTON; ABUNDANCE; SPECIES DIVERSITY; POPULATION DYNAMICS;
US-EPA-660/3-73-021; GCODE5;

525 STOERMER, EUGENE F.;
DIATOMS FROM THE GREAT LAKES. I. RARE OR POORLY KNOWN SPECIES OF THE GENERA DIPLONEIS, DENSTRUPIA AND STAURONEIS;
(1978) J GREAT LAKES RES 4(2):170-177;
BACILLARIOPHYCEAE; ALGAE; PHYTOPLANKTON; DIPLONEIS; DENSTRUPIA; STAURONEIS;

DISTRIBUTION; TAXONOMY;
7645; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
ELEVEN TAXA OF DIATOMS OCCURRING IN THE GREAT LAKES WHICH HAVE NOT BEEN ADEQUATELY TREATED IN THE NORTH AMERICAN LITERATURE ARE BRIEFLY DESCRIBED AND FIGURED. TAXA TREATED INCLUDE 4 SPECIES OF DIPLONEIS, 1 SPECIES AND 1 VARIETY OF DESTRUPIA, AND 1 SPECIES AND 4 INTRASPECIFIC TAXA OF STAURONEIS. THE PRESENTLY KNOWN DISTRIBUTION OF THESE ENTITIES IN THE GREAT LAKES AND THEIR ECOLOGICAL AND DISTRIBUTIONAL AFFINITIES ARE DISCUSSED.;

526 STOERMER, EUGENE F.;
THE EFFECTS OF ENERGY-RELATED EFFLUENTS ON PHYTOPLANKTON COMMUNITIES;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES INTERAGENCY COMMITTEE ON MARINE SCIENCE AND ENGINEERING OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY, PP409-422;
EFFLUENTS; DISCHARGE FLOW; PHYTOPLANKTON; COMMUNITY STRUCTURE; LITERATURE REVIEW;
US-FCS-F1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

527 STONE, UDELL B.; PASKO, DONALD G.; ROECKER, ROBERT M.;
A STUDY OF LAKE ONTARIO - ST. LAWRENCE RIVER SMALLMOUTH BASS;
(1954) NY FISH AND GAME J, 1(1):1-26;
TAGGING; FISH; CREEL; SPAWNING; MICROPTERUS DOLOMIEUI; MIGRATION; GROWTH;
GCODE5D4; GCODE5D5;
A STUDY OF SMALLMOUTH BASS OF THE EASTERN LAKE ONTARIO-THOUSAND ISLANDS REGION WAS CARRIED ON DURING 1944-50. TAGGING OF 4,408 WILD, ADULT BASS AT 10 PRINCIPAL LOCALITIES WAS UNDERTAKEN TO DETERMINE IF POPULATIONS WERE HOMOGENEOUS. STUDIES OF AGE, GROWTH AND REPRODUCTION OF THE BASS FROM DIFFERENT LOCALITIES WERE MADE. METAL STRAP TAGS USED ON THE DORSAL FIN AND MAXILLARY DURING 1944-45 GAVE RECOVERIES OF ONLY 2.0% AND 5.1%, RESPECTIVELY. DURING 1946-50, ROUND, METAL STRAP TAGS, APPLIED TO THE LOWER JAW, WERE USED ON A TOTAL OF 2,853 FISH. THIS METHOD GAVE 612 RECOVERIES (21.5%). ANGLING RECOVERIES WERE USED AS AN INDEX TO THE CATCH OF BASS ON VARIOUS GROUNDS DURING DIFFERENT MONTHS OF THE FISHING SEASON. DESPITE A RELATIVELY HEAVY TAKE OF BASS ON SOME GROUNDS DURING JUNE THERE WAS NO EVIDENCE THAT THE EARLY FISHING AFFECTED THE POPULATION ADVERSELY. HEAVIEST RETURNS, GENERALLY, WERE IN AUGUST. DISTINCT POPULATIONS OF BASS WERE RECOGNIZED USING MIGRATIONS AND GROWTH AS THE MAIN CRITERIA FOR SEPARATION. FOUR TO 6 YRS ARE REQUIRED IN THIS AREA FOR BASS TO REACH THE LEGAL LENGTH OF 10 INCHES. THE OLDEST BASS FOUND WERE 14 YRS OLD. CONSIDERABLE VARIATION IN SPAWNING TIME WAS FOUND TO BE A CHARACTERISTIC OF BASS IN THIS REGION. LATE MAY TO EARLY JUNE SPAWNING OCCURRED IN TRIBUTARY STREAMS AND IN SOME OF THE WARMER BAYS WHILE LATE JUNE-JULY SPAWNING OCCURRED AMONG THE FISH INFLUENCED BY THE COLD WATER OF LAKE ONTARIO;

528 STONE AND WEBSTER ENGINEERING CORPORATION;
ENVIRONMENTAL REPORT OSWEGO STEAM STATION - UNIT 5 FOR NIAGARA MOHAWK POWER CORPORATION;
(   ) STONE AND WEBSTER ENGINEERING CORPORATION. CA. 200 PP.;
OSWEGO STEAM STATION; ELECTRIC POWER GENERATING STATIONS; ELECTRIC POWER GENERATION; WATER QUALITY; FISH; PHYTOPLANKTON;
NPP-1-5; GCODE5; GCODE5D3T4;

529 STONE, R. S.; FRIGERIO, NORMAN A.;
PRESENT AND PROJECTED NUCLEAR GENERATING CAPACITIES AND FUEL REQUIREMENTS IN THE GREAT LAKES BASIN;
(1975) PROC 2ND FEDERAL CONF ON THE GREAT LAKES, PP155-162;
ENERGY; NUCLEAR POWER GENERATION; FORECASTING;
US-FCS-F1975; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

530 STRONG, ALAN E.;
GREAT LAKES TEMPERATURE MAPS BY SATELLITE (IFYGL);
(1974) PROC. 17TH CONF. GREAT LAKES RES. PP321-333;
TEMPERATURE; MONITORING; REMOTE SENSING; IFYGL; REMOTE SENSING SATELLITE;
2797; GCODE1; GCODE2; GCODE3, GCODE4; GCODE5; GCODE6;
FIVE CASE STUDIES USING VERY HIGH RESOLUTION RADIOMETER DATA FROM THE NOAA-2

SATELLITE ARE PRESENTED. THEY DEMONSTRATE A CAPABILITY FOR MONITORING SURFACE TEMPERATURES OF THE GREAT LAKES FROM SPACE. COMPARISONS OF THESE DATA WITH DATA AVAILABLE FROM MORE CONVENTIONAL SOURCES ARE USED TO ILLUSTRATE: 1) ISOTHERMAL CONDITIONS, 2) THERMAL-BAR CIRCULATIONS, 3) DIURNAL VARIABILITY, AND 4) SUMMER UPWELLING. EXAMPLES PRESENTED SHOW THE POTENTIAL FOR USING SATELLITE OBSERVATIONS ROUTINELY TO MONITOR SURFACE TEMPERATURES OF THE GREAT LAKES;

531 STRUTHERS, P. H.;
CARP CONTROL STUDIES IN THE ERIE CANAL;
(1929) NY STATE CONSERVATION DEPARTMENT. A BIOLOGICAL SURVEY OF THE ERIE NIAGARA SYSTEM. PP206-219;
ERIE CANAL; CYPRINUS; REPRODUCTION; FISH; GROWTH; FOOD; MIGRATION; NETS; CONTROL;
NY-C1; GCODE5A4T3S18;

532 SUBLETT, AUDREY J.;
OSTEOLOGICAL ANALYSIS OF THE VAN SON SITE;
(1966) BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN 24:49-65;
MAN; HISTORY;
BUF-BSNS-BULL24; GCODE5A4T3;

533 SUGDEN, DAVID E.;
GLACIAL EROSION BY THE LAURENTIDE ICE SHEET;
(1978) J GLACIOLOGY 20(83):367-391;
GLACIOLOGY; ICE; EROSION; TOPOGRAPHY;
7922; GCODE6; GCODE7;
THE AIM OF THIS PAPER IS TO EXAMINE LANDSCAPES OF GLACIAL EROSION ASSOCIATED WITH THE LAURENTIDE ICE SHEET AT ITS MAXIMUM AND TO RELATE THEM TO THE THREE MAIN VARIABLES AFFECTING GLACIAL EROSION, NAMELY FORMER BASAL THERMAL REGIME OF THE ICE SHEET, THE TOPOGRAPHY OF THE BED, AND THE GEOLOGY OF THE BED. THE KEY TO THE ANALYSIS IS THE COMPARISON OF THE DISTRIBUTION OF THE LANDSCAPE TYPES WITH THE SIMULATED PATTERN OF THE BASAL THERMAL REGIME OF THE FORMER ICE SHEET.;

53 SUTHERLAND, JEFFERY C.;
SILICATE MINERAL STABILITY AND MINERAL EQUILIBRIA IN THE GREAT LAKES;
(1970) ENVIRONMENTAL SCIENCE AND TECHNOLOGY. VOL. 4. PP826-833;
SILICATES; CARBONATE ; CHEMICAL COMPOSITION; MINERALOGY; WATER; LAKES;
2335; GCODE3; GCODE4; GCODE5;
EQUILIBRIUM CONCEPTS INVOLVING SILICATE MINERALS AND WATER ARE APPLIED TO CHEMICAL DATA FROM THE NORTH CHANNEL AND LAKES ERIE, ONTARIO, AND HURON, FOR UNDERSTANDING OF CHEMICAL SELF-REGULATION IN THE GREAT LAKES. EQUILIBRIA INVOLVING SILICATES AND WATER ARE INFERRED FROM AQUEOUS CHEMICAL DATA. CONCENTRATIONS OF DISSOLVED SILICA ATTAIN MINIMUM VALUES OF 10(EXP-4.8) MOLE/LITER IN SURFACE WATERS OF THE REMOTE LAKES THROUGH DISSOLUTION OF KAOLINITE. IN DEEPER WATERS, METASTABLE EQUILIBRIA, CA MONTMORILLONITE = GIBBSITE AND MUSCOVITE = GIBBSITE MAY IMPOSE UPPER LIMITS UPON CONCENTRATIONS OF SIO(SUB2)(AQ.). SILICA CONCENTRATIONS IN THE ENCLOSED WATERS OF SEDIMENTS FROM NORTH CHANNEL REACH METASTABLE EQUILIBRIUM WITH AMORPHOUS SILICA AT VALUES OF SIO(SUB2-)(AQ.)= 10(EXP-2.6)MOLE/LITER; VALUES OF LESS THAN 10(EXP-3) MOLE/LITER ARE IMPOSED IN SEDIMENTS FROM THE OTHER LAKES THROUGH CA MONTMORILLONITE = KAOLINITE. THE MAJOR CHEMICAL CHARACTER OF THE GREAT LAKES IS INHERITED FROM THE CARBONATE-SILICATE MINERALOGY OF BEDROCK, SOILS, AND GLACIAL DRIFT IN THEIR DRAINAGE;

535 SWEENEY, ROBERT A.;
ANALYSIS AND MODEL OF THE IMPACT OF DISCHARGES FROM THE NIAGARA AND GENESEE RIVERS ON THE NEAR-SHORE OF LAKE ONTARIO;
(1973) US EPA 1ST ANNUAL REPORTS OF THE EPA IFYGL PROJECTS, PP218-329;
BIOLOGY; PHYTOPLANKTON; ZOOPLANKTON;
BENTHOS; US-EPA-660/3-73-021; GCODE5C215; GCODE5A4T3; GCODE5B2; GCODE5B4;

536 SWEENEY, ROBERT A.;
LAKE ERIE FRAMEWORK STUDY. A STATEMENT PRESENTED BEFORE GREAT LAKES BASIN COMMISSION;

(1972) GREAT LAKES LAB. 3PP;
RESEARCH; DEVELOPMENT PLANNING; ECONOMICS; REGULATORY AGENCY; MONITORING;
POLLUTION;
NY-UBC-GLL-PS2; GCODE4; GCODE5; GCODE6;

637 SWEENEY, ROBERT A., COMP;
BIBLIOGRAPHY CONCERNING GREAT LAKES ATTACHED PLANTS;
(1976) GREAT LAKES LAB. PP. 31.;
BIBLIOGRAPHY; PLANTS; ALGAE; MACROPHYTES; CLADOPHORA;
REF-6-NY-UBC-GLL-P3; GCODE1; GCODE6; GCODE2; GCODE3; GCODE4; GCODE5;

638 SYMONS, GEORGE E.; SIMPSON, R. W.;
REPORT ON FISH DESTRUCTION IN THE NIAGARA RIVER IN 1937;
(1938) TRANS. AM. FISH. SOC. VOL. 66. PP246-255;
FISH; FISH KILLS; POLLUTION; WATER; DOROSOMA CEPEDIANUM; NOTROPIS ATHERINOIDES;
2600; GCODE465; GCODE5A4T3;
THE PAPER REPORTS ON THE STUDIES MADE TO DETERMINE THE POSSIBLE CAUSE OR CAUSES OF THREE EPIDEMICS OF FISH MORTALITY WHICH OCCURRED DURING NOVEMBER AND DECEMBER, 1937, IN THE VICINITY OF BUFFALO, NEW YORK. SAMPLES OF WATER AND DEAD FISH WERE ANALYZED TO DETERMINE THE LETHAL AGENT RESPONSIBLE FOR THE SLAUGHTER. STUDIES OF THE SOURCES OF POLLUTION IMPLICATED A SMALL STREAM DREDGED TO FORM PART OF THE BUFFALO HARBOR. THE SLUGGISH FLOW THROUGH THIS HARBOR RECEIVED THE WASTES OF SEVERAL LARGE CHEMICAL INDUSTRIES AND THE DOMESITC SEWAGE FROM A POPULATION OF SOME 75,000 PERSONS. THIS POLLUTION CREATED AN EXTREME SEPTIC CONDITION FOR THE MAJOR PART OF THE YEAR. COMBINATION OF WIND VELOCITY AND DIRECTION, RAINFALL, AND CHANGES IN LAKE LEVEL CAUSED SUDDEN DISCHARGES OF THE POLLUTED WATERS OF THIS SMALL STREAM INTO THE NIAGARA RIVER. AT SUCH TIMES FISH WERE FREQUENTLY OBSERVED TO DIE. AT THE TIME OF THE THREE PERIODS OF FISH MORTALITY SOME EXTREMELY LETHAL AGENT SEEMED TO BE PRESENT THAT NORMALLY MUST BE ABSENT, BECAUSE THE FISH MORTALITY WAS SO MUCH GREATER THAN HAD EVER BEEN OBSERVED PREVIOUSLY. THE COMBINATION OF CIRCUMSTANCES OF NUMEROUS POLLUTION SOURCES, NUMEROUS DELETERIOUS SUBSTANCES, AND THE TEMPORARY NATURE OF THE ACTUAL POISONING IN THE RIVER MADE IT IMPOSSIBLE TO FIX ANY ONE EFFLUENT AS RESPONSIBLE. INVESTIGATION DISCLOSED A SHORTAGE OF AVAILABLE DATA ON THE TOLERATION LIMITS OF FISH, ESPECIALLY UNDER RIVER CONDITIONS. THOUGH THE DESTRUCTION OF THE FISH WAS REGRETTABLE AND MUCH NEEDLESS CONCERN WAS RAISED OVER THE HEALTH OF THE NIAGARA RIVER COMMUNITIES, THESE THREE EPISODES DID SERVE TO FOCUS ATTENTION ON THE DEPLORABLE CONDITIONS EXISTING IN THE BUFFALO HARBOR. PLANS AND STUDIES ARE WELL UNDER WAY, BY THE INDUSTRIES INVOLVED, TO TREAT THEIR WASTES OR TO DISCHARGE A PART OF THEM INTO THE CITY SEWERS FOR TREATMENT. IT IS HOPED THAT WITHIN ANOTHER YEAR AT LEAST 90 PER CENT OF THIS POLLUTION WILL BE REMOVED AND THAT POSSIBLE FUTURE RECURRENCES OF SUCH EPISODES WILL BE FORESTALLED;

639 TAIT, HOWARD D.;
FEDERAL GREAT LAKES FISHERY RESEARCH, OBJECTIVES, PRIORITIES, AND PROJECTS;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP44-47;
US; REGULATORY AGENCY; RESEARCH; PROGRAMS; FISHERIES; FISH;
US-FCS-P1972; GCODE6;
FISHERY PRODUCTION OF THE GREAT LAKES REGION HAS DECLINED DRASTICALLY WITH SETTLEMENT OF THE AREA. PREMIUM QUALITY FISHES OF THE GREAT LAKES SUCH AS WHITEFISH, LAKE TROUT, AND WALLEYES HAVE BEEN REPLACED BY LESS DESIRED SPECIES. THE CHANGE IS ATTRIBUTED TO SELECTIVE OVERFISHING, POLLUTION, AND THE EXTREME INSTABILITY OF FISH POPULATIONS. SEA LAMPREY PREDATION IS STILL A VEXING PROBLEM BUT PROGRESS IS BEING MADE IN CONTROLLING THIS PARASITE. THE FEDERAL FISHERY RESEARCH PROGRAM WITH HEADQUARTERS IN ANN ARBOR, MI, HAS THE OBJECTIVE OF PROVIDING BASELINE INFORMATION, NEEDED IN RESOURCE USE DECISIONS, ABOUT THE FISHES OF THE GREAT LAKES. STUDIES OF THE HABITAT REQUIREMENTS OF FISH ARE HIGH PRIORITY. THE PROGRAM INCLUDES FISH POPULATION ASSESSMENTS, STUDIES OF THE EFFECTS OF MERCURY AND OTHER CONTAMINANTS ON FISH, THERMAL EFFECT STUDIES, AND GENERAL INVESTIGATION OF THE IMPACT OF ENGINEERING PROJECTS ON GREAT LAKES FISHERIES. THE WORK IS CLOSELY COORDINATED WITH STATE AND CANADIAN AGENCIES THROUGH THE GREAT LAKES FISHERY COMMISSION. 4 SMALL RESEARCH VESSELS AND 4 FIELD STATIONS ARE UTILIZED WITH A STAFF OF 90 AND AN ANNUAL BUDGET OF ABOUT 1.5 MILLION

DOLLARS.;

540 TAIT, HOWARD D.;
GREAT LAKES FISHERY LABORATORY;
(1971) US DEPARTMENT OF THE INTERIOR, PROGRESS IN SPORT FISHERY RESEARCH, PP. 86-120;
FISHERIES; RESEARCH; ALOSA PSEUDOHARENGUS; SALVELINUS NAMAYCUSH; POPULATION; PERCA FLAVESCENS; ROCCUS SAXATILLIS; STIZOSTEDION; OSMERUS; DOROSOMA CEPEDIANUM; AMBLOPLITES RUPESTRIS; GASTEROSTEUS ; PONTOPOREIA; HEXAGENIA; MERCURY; PESTICIDES; DISSOLVED OXYGEN; ICTALURUS; ARSENIC; SELENIUM;
GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; 5360;

541 TANNER, HOWARD;
GREAT LAKES FISHERIES;
(1966) MI NATURAL RESOURCES COUNCIL, 11TH ANNUAL CONFERENCE. PP15-19;
FISH; COMMERCIAL FISHERIES; FISHERIES;
MI-NRC-C11; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

542 THOMANN, ROBERT V.; WINFIELD, RICHARD P.; SZUMSKI, DANIEL S.;
ESTIMATED RESPONSES OF LAKE ONTARIO PHYTOPLANKTON BIOMASS TO VARYING NUTRIENT LEVELS;
(1977) J GREAT LAKES RES 3(1-2):123-131;
PHYTOPLANKTON; BIOMASS; NUTRIENTS; NUTRIENT LOADING; MODEL STUDIES; MATHEMATICAL MODELS; WATER QUALITY;
GCODE5A4T3;
A SERIES OF SIMULATIONS OF THE RESPONSE OF THE OPEN LAKE REGION OF LAKE ONTARIO TO VARIOUS LEVELS OF NUTRIENT INPUT IS DESCRIBED USING A SIMPLIFIED DYNAMIC MODEL OF PHYTOPLANKTON-NUTRIENT INTERACTIONS IN A VERTICALLY SEGMENTED LAKE. THE ANALYSIS OF THE SIMULATIONS INDICATES THE IMPORTANCE OF THE OVERALL LOSS RATES OF NUTRIENT. UNDER AN HYPOTHESIZED, BUT REASONABLE, SET OF MODEL PARAMETERS, THE SIMULATIONS INDICATE THAT THE PRESENT OBSERVED OPEN LAKE PHYTOPLANKTON BIOMASS OF LAKE ONTARIO DOES NOT APPEAR TO BE IN EQUILIBRIUM WITH THE PRESENT INPUT NUTRIENT LOAD. FOR AN ASSUMED EQUILIBRIUM CONDITION, THE SIMULATIONS INDICATE THAT REDUCTIONS IN PHOSPHORUS LOAD WILL BE ACCOMPANIED BY REDUCTION IN BIOMASS. A "PASTORAL" SIMULATION USING LOAD ESTIMATES CONSISTENT WITH THE CONDITIONS PRIOR TO MAN'S INTENSIVE ACTIVITY INDICATES THAT SPRING PHYTOPLANKTON LEVELS WERE 30%-70% OF PRESENT LEVELS DEPENDENT UPON THE KINETIC ASSUMPTIONS. ANALYSIS OF LAKE RESPONSE TO THE US-CANADA WATER QUALITY AGREEMENT LOADS USING 3 KINETIC ASSUMPTIONS (OPTIMISTIC, REASONABLE, PESSIMISTIC) INDICATES A RANGE FROM 25% DECREASE TO 60% INCREASE IN PEAK PHYTOPLANKTON OVER PRESENT LEVELS. FOR AN IMPLEMENTATION PERIOD OF 10 YEARS, A LOAD REDUCTION RATE OF ABOUT 1-1.5 METRIC TONS PHOSPHORUS/DAY/YEAR APPEARS TO BE A SOUND OBJECTIVE TO MAINTAIN OR REDUCE PRESENT PHYTOPLANKTON LEVELS.;

543 THOMAS, NELSON A.; HARTWELL, KATHERINE; MILLER, WILLIAM E.;
GREAT LAKES NUTRIENT ASSESSMENT;
(1975) US EPA PROC. BIOSTIMULATION/AND/NUTRIENT ASSESSMENT WORKSHOP. OCT. 16-17, 1973 CORVALLIS, OR. PP.226-243;
CLADOPHORA; ALGAE CONTROL; BIOASSAY; NUTRIENTS; PHYTOPLANKTON; PRIMARY PRODUCTIVITY;
US-EPA-660/3-75-034; GCODE6; GCODE5;

544 THOMAS, RICHARD L.;
THE DISTRIBUTION AND TRANSPORT OF MERCURY IN THE SEDIMENTS OF THE LAURENTIAN GREAT LAKES SYSTEM;
(1977) BURLINGTON, ONT., GREAT LAKES BIOLIMNOLOGY LAB., CANADA CENTRE FOR INLAND WATERS, PP. 1-49;
MERCURY; TRANSPORT; SEDIMENT; DISTRIBUTION;
GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; 4654;

545 THOMAS, RICHARD L.;
A NOTE ON THE RELATIONSHIP OF GRAIN SIZE, CLAY CONTENT, QUARTZ AND ORGANIC CARBON IN SOME LAKE ERIE AND LAKE ONTARIO SEDIMENTS;
(1969) J. SEDIMENTARY PETROLOGY. VOL. 39. PP803-809;

MINERALOGY; SEDIMENT; GRAIN SIZE; ANALYSIS;
2460; GCODE4; GCODE5;

546 THOMAS, RICHARD L.;
SURFACE SEDIMENTS OF THE GREAT LAKES;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON
ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P161;
SEDIMENT; HEAVY METALS; CHEMICAL COMPOSITION; PESTICIDES;
IJC-RA7; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

547 THOMAS, RICHARD L.; HARAS, WILLIAM S.;
CONTRIBUTION OF SEDIMENT AND ASSOCIATED ELEMENTS TO THE GREAT LAKES FROM EROSION
OF THE CANADIAN SHORELINE;
(   ) IJC PLUARG TECHNICAL REPORT TASK D ACTIVITY 1, PP57;
SEDIMENT; EROSION; SEDIMENTATION; PHOSPHORUS; PHOSPHORUS LOADING; HEAVY METALS;
MATHEMATICAL MODELS;
IJC-L-PLUARG-II; GCODE3; GCODE4; GCODE5;

548 THOMSEN, ARVID L.;
PUBLIC PARTICIPATION IN WATER AND LAND MANAGEMENT;
(1973) NY SEA GRANT CORNELL U GREAT LAKES MANAGEMENT PROBLEMS SERIES, PP 194;
MANAGEMENT; WATER; LAND USE; PUBLIC PARTICIPATION;
US-CS-NY-C1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

549 THOMSON, KEITH P. B.;
REMOTE SENSING;
(1972) IFYGL B NO 4, PP9-13;
CANADA; IFYGL; REMOTE SENSING; PROGRAMS;
IFY-84; GCODE5;

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LAMPREY CONTROL IN CANADA;
(1973) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1971, APPENDIX
D, P42-48;
PETROMYZON MARINUS; CONTROL; ELECTRICAL LAMPREY BARRIERS; LAMPRICIDES;
GLF-AR-1971; GCODE1; GCODE3; GCODE5;

551 TIBBLES, J. JAMES; JOHNSON, B. G. HERBERT;
SEA LAMPREY CONTROL IN CANADA;
(1973) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1972, APPENDIX
D, P60-65;
PETROMYZON MARINUS; CONTROL; ELECTRICAL LAMPREY BARRIERS; LAMPRICIDES;
GLF-AR-1972; GCODE1; GCODE3; GCODE5;

552 TIBBLES, J. JAMES; LAMSA, AARNE K.; JOHNSON, B. G. HERBERT;
LAMPREY CONTROL EXPERIMENT IN CANADA;
(1968) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1967, APPENDIX
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PETROMYZON MARINUS; CONTROL; ELECTRICAL LAMPREY BARRIERS; LAMPRICIDES;
GLF-AR-1967; GCODE1; GCODE3; GCODE4; GCODE5;

553 TIBBLES, J. JAMES; LAMSA, AARNE K.; JOHNSON, B. G. HERBERT;
LAMPREY CONTROL IN CANADA;
(1970) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1969, APPENDIX
D, P41-47;
PETROMYZON MARINUS; CONTROL; ELECTRICAL LAMPREY BARRIERS; LAMPRICIDES;
GLF-AR-1969; GCODE1; GCODE3; GCODE5;

554 TIBBLES, J. JAMES; LAMSA, AARNE K.; JOHNSON, B. G. HERBERT;
LAMPREY CONTROL IN CANADA;
(1972) GREAT LAKES FISHERY COMMISSION. ANNUAL REPORT FOR THE YEAR 1970, APPENDIX
D, P43-48;
PETROMYZON MARINUS; CONTROL; ELECTRICAL LAMPREY BARRIERS; LAMPRICIDES;

GLF-AF-1970; GCODE1; GCODE3; GCODE5;

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(1934) GAMMA ALPHA RECORD. VOL. 24, NO. 3. PP. 100-106.;
HYDROLOGY; BIOLOGY; RESEARCH; BOTANY; ECONOMICS;
6433; GCODE4; GCODE6;

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NATURAL AND POLLUTION SOURCES OF IODINE, BROMINE, AND CHLORINE IN THE GREAT LAKES;
(1969) J. OF WATER POLLUTION CONTROL CONFERENCE, CHICAGO. PP1319-1329;
BROMINE; CHLORINE; IODINE; POLLUTION; WATER;
1466; GCODE1D2T2; GCODE1D2T1; GCODE1B3T7; GCODE1A5T1; GCODE1B1T3; GCODE1B4T4;
GCODE1B4T1; GCODE1A3T2; GCODE4A2T1; GCODE4A1T3; GCODE1M4T3; GCODE1M4T4; GCODE1;
GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

557 TORGERSEN, THOMAS; TOP, ZAFER; CLARKE, WILLIAM B.; JENKINS, WILLIAM J.; BROEKER, WALLACE S.;
A NEW METHOD FOR PHYSICAL LIMNOLOGY - TRITIUM-HELIUM-3 AGES-RESULTS FOR LAKES ERIE, HURON, AND ONTARIO;
LIMNOLOGY AND OCEANOGRAPHY 22(2):181-193.
TRACERS; GEOLOGY;
5172; GCODE3; GCODE4; GCODE5;
A NEW METHOD IN PHYSICAL LIMNOLOGY BASED ON THE RADIOACTIVE TRACER TRITIUM AND ITS STABLE DAUGHTER PRODUCT, 3HE, IS EXAMINED. THE 3HE PRODUCED BY THE IN SITU DECAY OF TRITIUM CAN BE USED TO CALCULATE AN EFFECTIVE WATER MASS AGE. THESE AGES CAN THEN BE USED TO ESTIMATE GAS EXCHANGE RATES, GAS RENEWAL AT TURNOVER, AND VERTICAL DIFFUSIVITY IN THE EPILIMNION.;

558 TRESSLER, WILLIS L.; AUSTIN, THOMAS S.; ORBAN, EDWARD;
SEASONAL VARIATION OF SOME LIMNOLOGICAL FACTORS IN IRONDEQUOIT BAY, NY;
(1953) AMERICAN MIDLAND NATURALIST. VOL. 49. PP878-903;
MORPHOLOGY; HYDROLOGY; TEMPERATURE; SECCHI DEPTH; SPECIFIC CONDUCTIVITY;
CHEMICAL COMPOSITION; DISSOLVED OXYGEN; PHOSPHORUS; POLLUTION; ZOOPLANKTON;
COPEPODA; CLADOCERA; ROTIFERA; PHYTOPLANKTON; CHLOROPHYTA; MYXOPHYCEAE; DIATOMA;
PROTOZOA; PRIMARY PRODUCTIVITY;
2550; GCODE5C2;

559 TRITMAN, NEIL D;
CHLOROPHYLL AND PHAEOPHYTIN DETERMINATION OF A PHYTOPLANKTON COMMUNITY DURING AND AFTER ICE-COVER;
(1974) RICE CREEK BIOLOGICAL FIELD STATION BULLETIN, 1(1):52-58;
CHLOROPHYLL; PHYTOPLANKTON; ICE; WATER;
NY-UOS-B1974-1; GCODE5D3;
CHANGES IN THE QUANTITY OF CHLOROPHYLL IN A COMMUNITY OF PHYTOPLANKTON AT 3 LEVELS IN THE WATER COLUMN WERE FOLLOWED THROUGH 3 SAMPLING DATES. THESE DATES SPANNED THE INTERVAL JUST PRIOR TO THE SPRING THAW AND JUST AFTER THE THAW. THE VALUES OBTAINED WERE THEN RELATED TO THE PHYTOPLANKTON POPULATION PRESENT AT EACH LEVEL TO DISCUSS POSSIBLE QUANTITATIVE AND QUALITATIVE RELATIONSHIPS;

560 TULLY, WILLIAM P.; THONET, JOHN A; BOLTON, ROBERT; KLOTZ, RONALD; ATMAWIDJAJA, RUBINI;
DEVELOPMENT SUITABILITY;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 92P;
ENGINEERING; DEVELOPMENT PLANNING; LAND USE; MATHEMATICAL MODELS; HYDROLOGY;
WATER SUPPLY; RUNOFF DRAINAGE; GROUND WATER;
SLE-ST7; GCODE5D4; GCODE5D5; GCODE7;
THE ENGINEERING ANALYSIS OF THE DEVELOPMENT POTENTIAL OF THE STUDY AREA INCLUDED CONSIDERATIONS OF IMMEDIATE SUITABILITY AS WELL AS LONG RANGE IMPLICATIONS. REGARDING IMMEDIATE SUITABILITY, THE ANALYSIS WAS MADE BY THE USE OF PREVIOUSLY GATHERED DATA CONCERNING SOILS, FLOODING, WATER SUPPLY AND TOPOGRAPHY. AREAS DEFINED AS "RESIDUAL" WERE CLASSIFIED CONCERNING DEVELOPMENT SUITABILITY BY

CRITERIA CHARACTERISTICS AND METHODOLOGY AGREED UPON MUTUALLY BY MEMBERS OF GPS AND THE COLLEGE. THE THRUST OF THE ANALYSIS FOR LONG RANGE IMPLICATIONS FOCUSED ON DETERMINING THE FEASIBILITY OF DIGITALLY MODELING THE STORM WATER RUNOFF IN THE STUDY AREA. THE POTENTIAL USE OF SUCH A MODEL WOULD BE TO AID THE EVALUATION OF THE EFFECTS OF THE DISPOSITION OF ERODED SOIL OR OTHER POLLUTANTS ON THE ECOLOGY OF THE MARSH-BAY SYSTEMS OF THE STUDY AREA. THIS PORTION OF THE STUDY REQUIRED THE MEASUREMENT AND COLLECTION OF SOME NEW FORMS OF DATA TO INVESTIGATE THE REGIONAL HYDROLOGIC HOMOGENEITY OF THE TOPOGRAPHY OF THE STUDY AREA. THE COLLECTION AND PRESENTATION OF THE ELEMENTS OF THE CLASSIFICATION SCHEME ARE PRESENTED IN TABULAR AND GRAPHICAL FORM IN THE REPORT, MAP 11, MAJOR ENGINEERING LIMITATIONS FOR DEVELOPMENT. ALTHOUGH MUCH OF THE STUDY AREA IS CLASSIFIED AS "LEAST SUITABLE" FOR DEVELOPMENT DUE TO A LOW POTENTIAL FOR SEWAGE DISPOSAL, A GENERALIZED INTERPRETATION OF MAP 11 SHOULD BE SUPPLEMENTED BY IN DEPTH SITE INVESTIGATIONS BEFORE THE DETAILS OF ANY DEVELOPMENT PROPOSAL ARE JUDGED. THE DERIVED CLASSIFICATION SYSTEM COULD BE SIGNIFICANTLY IMPROVED BY SPECIFIC DETAILED INVESTIGATIONS REFINING THE DATA ON POTENTIAL FOR SEWAGE DISPOSAL AND GROUND WATER QUALITY CHARACTERISTICS. THE TIME FRAME FOR THIS STUDY PRECLUDED ATTEMPTS AT SUCH ANALYSES IN THIS REPORT. THE PORTION OF THE STUDY ON STORM WATER RUNOFF MODELING FEASIBILITY SHOWED THE REGION TO BE QUITE TOPOGRAPHICALLY HOMOGENEOUS. AND IN FACT THERE APPEARS TO BE SUBSTANTIAL PROMISE FOR PREDICTING THE FLOW IN THE SMALL UNGAUGED STREAMS IN THE REGION BY SYNTHETIC HYDROLOGY. ALTHOUGH IMPORTANT DETAILED INFILTRATION AND PRECIPITATION DATA WERE NOT AVAILABLE FOR MOST OF THE STUDY AREA, THE TECHNIQUE OF DEVELOPING A STANDARD UNIT HYDROGRAPH FROM THE DATA OF A GAUGED STREAM AND ITS TRANSPOSITION TO AN UNGAUGED STREAM BY TOPOGRAPHIC CHARACTERISTICS WAS SHOWN TO PRODUCE REASONABLE HOMOGENEOUS RESULTS. THE ADDITION OF DETAILED INFILTRATION AND PRECIPITATION DATA IS REQUIRED TO MAKE THE MODEL MORE REPRESENTATIVE AND FUNCTIONAL;

561 UNITED STATES; CANADA;
GREAT LAKES WATER QUALITY AGREEMENT OF 1978. AGREEMENT WITH ANNEXES AND TERMS OF REFERENCE, BETWEEN THE UNITED STATES OF AMERICA AND CANADA SIGNED AT OTTAWA NOVEMBER 22, 1978;
(1978) IJC, 52P;
WATER QUALITY; REGULATION; IJC; PHOSPHORUS; OIL; DREDGING; DISCHARGE FLOW;
REF-L-IC-1978-F; GCODE0;

562 US ARMY CORPS OF ENGINEERS;
REPORT ON GREAT LAKES OPEN - COAST FLOOD LEVELS;
(1977) US ARMY CORPS OF ENGINEERS;
WATER LEVELS; WIND; FLOOD CONTROL;
US-CE4; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

563 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
BLACK RIVER, NEW YORK FLOOD PLAIN INFORMATION;
(1977) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP32 + 11 PLATES;
FLOODS; FLOOD PLAIN; FLOOD CONTROL; REGULATION;
US-CE-BL-F5D4T1; GCODE5D4T1;

564 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
CAYUGA CREEK IN THE TOWNS OF WEST SENECA, CHEEKTOWAGA AND LANCASTER FLOOD PLAIN INFORMATION;
(1967) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP42 + 2 PLATES + ATTACHMENT;
FLOOD PLAIN; FLOODS; FLOOD CONTROL; REGULATION; HISTORY;
US-CE-BL-F5A413S4; GCODE5A413S4;

565 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
CREEK WIDENING, CLEARING DEBRIS AND REMOVAL OF EXISTING LOW WATER DAM PROJECT;
(1978) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP12 +;
ENVIRONMENT; IMPACT; DAMS; WATER LEVELS;
US-CE-BL-F5D312A1; GCODE5D312;

566 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
DEBRIS AND LOW WATER DAM REMOVAL, NINEMILE CREEK, AMBOY, NEW YORK;

(1977) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, AP11;
ENVIRONMENT; IMPACT; DAMS; WATER LEVELS;
US-CE-BU-F5D3T2A; GCODE5D3T2;

567 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
DRAFT ENVIRONMENTAL STATEMENT OSWEGO STEAM STATION UNIT 5 NIAGARA MOHAWK POWER CORPORATION;
(1971) US ARMY CORPS OF ENGINEERS, 141P;
ENVIRONMENT; IMPACT; HYDROLOGY; LAND USE; ELECTRIC POWER GENERATING STATIONS;
POPULATION DYNAMICS; FISH;
US-CE-BU-E1-6D; GCODE5D3;

568 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
ELLICOTT CREEK IN THE TOWNS OF LANCASTER & ALDEN AND IN THE VILLAGE OF ALDEN, ERIE COUNTY, NEW YORK FLOOD PLAIN INFORMATION;
(1972) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP56 + 9 PLATES;
FLOOD PLAIN; FLOODS; FLOOD CONTROL; REGULATION; HISTORY;
US-CE-BU-F5A4T3S2; GCODE5A4T3S2;

569 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
FINAL ENVIRONMENTAL IMPACT STATEMENT PERMIT APPLICATION BY NEW YORK STATE ELECTRIC AND GAS CORPORATION PROPOSED CAYUGA STATION SOMERSET, NEW YORK;
(1979) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, 683P;
ELECTRIC POWER GENERATING STATIONS; LAND USE; RECREATION; WATER SUPPLY;
NAVIGATION; METEOROLOGY; AIR POLLUTION; LAKE LEVELS; WATER QUALITY; ENVIRONMENT;
IMPACT; PHYTOPLANKTON; ZOOPLANKTON; AVES; ENDANGERED SPECIES; PLANTS; BENTHOS;
US-CE-BU-E1-17; GCODE5B2;

570 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
HAMLIN BEACH STATE PARK COOPERATIVE BEACH EROSION CONTROL PROJECT LAKE ONTARIO, MONROE COUNTY, NEW YORK. FINAL ENVIRONMENTAL STATEMENT;
(1972) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, 25P;
GROINS; RECREATION; EROSION CONTROL; ENVIRONMENT; IMPACT;
US-CE-BU-E12L; GCODE5B4;

571 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
NEW YORK STATE HARBORS;
(1976) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT FOR NY DEPT OF ENVIRONMENTAL CONSERVATION, UNPAGED;
NY; HARBORS; PHYSICAL CHARACTERISTICS; FACILITIES; STRUCTURES; RECREATION; FISH;
STOCKING;
REF-G-US-CE-BU; GCODE4; GCODE5, GCODE7; GCODE4G2; GCODE4G4; GCODE4G3; GCODE4G5;
GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D5;

572 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
NINEMILE CREEK FLOOD PLAIN INFORMATION;
(1976) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP51 + 13 PLATES;
FLOOD PLAIN; FLOODS; HISTORY; FLOOD CONTROL; REGULATION;
US-CE-BU-F5D3T2; GCODE5D3T2;

573 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
OAK ORCHARD HARBOR, ORLEANS COUNTY, NEW YORK, FINAL ENVIRONMENTAL STATEMENT;
(1972) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, 13P, MAP;
HARBORS; JETTIES; DREDGING; BREAKWATERS; BENTHOS; SEDIMENT; WATER; CHEMISTRY;
ENVIRONMENT; IMPACT;
US-CE-BU-E129; GCODE5B4; GCODE5B4T3;

574 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
CATTA CREEK AND GENESEE RIVER FLOOD PLAIN INFORMATION;
(1973) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP32 + 11 PLATES;
FLOOD PLAIN; FLOOD CONTROL; FLOODS; HISTORY; REGULATION;
US-CE-BU-F5C2T5; GCODE5C2T5;

575 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;

ROCHESTER HARBOR, MONROE COUNTY, NEW YORK, FINAL ENVIRONMENTAL STATEMENT;
(1972) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, 15P, 2 MAPS, 17 APP;
HARBORS; DREDGING; SEDIMENT; ENVIRONMENT; IMPACT;
US-CE-BU-E118; GCODE5C2;

576 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
ST LAWRENCE SEAWAY, N.Y. FEASIBILITY STUDY FOR ADDITIONAL LOCKS AND OTHER NAVIGATION IMPROVEMENTS. PLAN OF STUDY, DRAFT;
(1976) US ARMY CORPS OF ENGINEERS, 526P;
CANALS; NAVIGATION; GEOMORPHOLOGY; METEOROLOGY; WATER LEVELS; PLANTS; WETLANDS; FISH; PHYTOPLANKTON; ZOOPLANKTON; HABITAT; AVES; SPAWNING; MAMMALIA; AMPHIBIANS; ENDANGERED SPECIES; RECREATION; LAND USE; ECONOMICS; PUBLIC PARTICIPATION;
US-CE-BU-SLS; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;

577 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
SCAJAQUADA CREEK IN THE TOWNS OF CHEEKTOWAGA AND LANCASTER ERIE COUNTY, NEW YORK FLOOD PLAIN INFORMATION;
(1969) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP67 + 8 PLATES;
FLOODS; FLOOD PLAIN; FLOOD CONTROL; HISTORY; REGULATION;
US-CE-BU-F5A413S1; GCODE5A413S1;

578 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
STREAMBANK EROSION ON THE GENESEE RIVER ALONG LATTICE BRIDGE ROAD, CANEADEA, NY;
(1976) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT, PP 4 +;
SHORE; EROSION; FLOODS;
US-CE-BU-F5C215B; GCODE5C215;

579 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
TONAWANDA CREEK WATERSHED INTERIM FLOOD MANAGEMENT STUDY;
(1976) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT BUFFALO METROPOLITAN AREA, NY WATER RESOURCE MANAGEMENT STUDY FINAL FEASIBILITY REPORT, PP75 + 14 PLATES;
PHYSICAL CHARACTERISTICS; FLOOD PLAIN, REGULATION; CLIMATOLOGY
US-CE-BU-F5A413S3;
GCODE5A413S3;

580 US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
TONAWANDA CREEK WATERSHED INTERIM FLOOD MANAGEMENT STUDY APPENDICES;
(1976) US ARMY CORPS OF ENGINEERS BUFFALO DISTRICT;
HYDROLOGY; FLOODS; FLOOD CONTROL; REGULATION; COST-BENEFIT ANALYSIS;
ENGINEERING; GEOLOGY; PUBLIC PARTICIPATION;
US-CE-BU-F5A413F3A; GCODE5A413S3;

581 US ARMY CORPS OF ENGINEERS NORTH ATLANTIC DIVISION;
WATER RESOURCES DEVELOPMENT IN NEW YORK;
(1977) U.S. ARMY CORPS OF ENGINEERS. 148 PP;
NY; WATER; RESOURCES; DEVELOPMENT PLANNING; FLOOD CONTROL; WATER QUALITY;
US-CE-NA-NY-1977; GCODE4; GCODE5;

582 US ARMY CORPS OF ENGINEERS NORTH CENTRAL DIVISION;
WATER LEVELS OF THE GREAT LAKES REPORT ON LAKE REGULATION APPENDIX D EFFECTS OF LAKE REGULATION ON NAVIGATION;
(1965) US ARMY CORPS OF ENGINEERS NORTH CENTRAL DIVISION ,PP16 + TABLES & PLATES;
WATER LEVELS; NAVIGATION; REGULATION; HARBORS; BOATS;
US-CE-NC1D; GCODE2; GCODE3; GCODE4; GCODE6;

583 US ARMY CORPS OF ENGINEERS NORTH CENTRAL DIVISION;
WATER LEVELS OF THE GREAT LAKES REPORT ON LAKE REGULATION APPENDIX E EFFECTS ON NIAGARA POWER OF REGULATING LAKE ERIE;
(1965) US ARMY CORPS OF ENGINEERS NORTH CENTRAL DIVISION, PP25 + 5 PLATES;
WATER LEVELS; DIVERSIONS; CURRENTS; VOLUME AND CURRENT FLOW; ELECTRIC POWER GENERATION; ELECTRIC POWER GENERATING STATIONS; COST-BENEFIT ANALYSIS; LAKE LEVELS;
US-CE-NC1E; GCODE5A411; GCODE5A413;

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LAKE ONTARIO SHORE PROTECTION STUDY: LITERATURE REVIEW REPORT.(U)
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584 US ARMY CORPS OF ENGINEERS NORTH CENTRAL DIVISION;
WATER LEVELS OF THE GREAT LAKES REPORT ON LAKE REGULATION APPENDIX F REGULATORY
WORKS;
(1965) US ARMY CORPS OF ENGINEERS NORTH CENTRAL DIVISION, PP22 + 14 PLATES;
REGULATION; WATER LEVELS; METHODS; ENGINEERING; OUTFLOW AND INFLOW;
US-CE-NCIF; GCODE2; GCODE3; GCODE4A1T3; GCODE5A4T3; GCODE6;

585 US DEPT OF INTERIOR B OF OUTDOOR RECREATION;
WATER-ORIENTED OUTDOOR RECREATION IN THE LAKE ONTARIO BASIN;
(1967) US DEPT OF INTERIOR B OF OUTDOOR RECREATION;
WATER; RECREATION; ONEIDA LAKE; CAYUGA LAKE; SENECA LAKE; ONONDAGA LAKE; NY;
BEACHES; FISHING; FISHING GROUNDS; BOATS; WATER QUALITY;
US-I-O2; GCODE5C2; GCODE5;

586 US DEPT OF INTERIOR FISH AND WILDLIFE SERVICE;
FISH AND WILDLIFE AS RELATED TO WATER QUALITY OF THE LAKE ONTARIO BASIN;
(1969) US DEPT OF INTERIOR, 128P;
FISH; WILDLIFE; FISHERIES; WATER QUALITY; PHYSICAL CHARACTERISTICS; MORPHOLOGY;
TEMPERATURE; ICE; HISTORY; SEDIMENT; CURRENTS; LIGHT INTENSITY; TRANSPARENCY;
CHEMICAL COMPOSITION; PHYTOPLANKTON; ZOOPLANKTON; ALGAE; BENTHOS; POPULATION
DYNAMICS; SPECIES DIVERSITY; PERCA FLAVESCENS; STIZOSTEDION VITREUM;
LEUCICHTHYS; LEPOMIS; COREGONUS; CYPRINUS; OSMERUS; ICTALURUS; ESOX LUCIUS;
ANGUILLA; SALVELINUS NAMAYCUSH;
US-IF-SR69; GCODE5A4T3; GCODE5C2T5; GCODE5D3T4; GCODE5C2T3; GCODE5D3; GCODE5C2;

587 US DEPT OF INTERIOR FISH AND WILDLIFE SERVICE;
LIST OF ENDANGERED AND THREATENED WILDLIFE AND PLANTS;
(1979) FEDERAL REGISTER 44(12)3636-3654;
US; ENDANGERED SPECIES; FISH; WILDLIFE; AVES; AMPHIBIANS; GASTROPODA;
PELECYPODA; INSECTA; PLANTS;
8C87;

588 US DEPT OF INTERIOR FISH AND WILDLIFE SERVICE REGION 5 NY FIELD STATION;
GENERAL BIOLOGICAL SURVEY AND IMPACT ASSESSMENTS FOR THE FORT ONTARIO HARBOR
PROJECT, NEW YORK;
(1977) US DEPT OF INTERIOR, 152P;
PLANTS; BENTHOS; FISH; INVERTEBRATES; AVES;
US-IF-EI-1; GCODE5D5; GCODE5D5T5;

589 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1968) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 366P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-68-1; GCODE4G5T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S18; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

590 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1969) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 283P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-69-1; GCODE4G5T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S18; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

591 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1970) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 302P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-70-1; GCODE4G5T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;

GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

592 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1971) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 311P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-71-1; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

593 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1972) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 313P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-72-1; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

594 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1973) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 316P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER, CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-73-1; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

595 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1974) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 326P, 2 MAPS;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-74-1; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

596 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 1 SURFACE WATER RECORDS;
(1977) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 376P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-67-1; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

597 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1966) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 166P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-66-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

598 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1967) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 160P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
UA-IF-GES-NY-67-2& Ob FXOSw4F3R4% 08 FCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S16; GCODE5B4T3;

GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

599 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1968) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 137P;
NY; HYDROLOGY, GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-68-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

600 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
EATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1969) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 119P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-69-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6, GCODE5D3T4; GCODE5D4T1;

601 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1970) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 256P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT, WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-70-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

602 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1971) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 254P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-71-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

603 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1972) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 262P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-72-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

604 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1973) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 298P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-73-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

605 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK PART 2 WATER QUALITY RECORDS;
(1974) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 360P, 2 MAPS;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-74-2; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

606 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK WATER YEAR 1975;
(1975) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 735P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-75; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

607 US DEPT OF INTERIOR GEOLOGICAL SURVEY;
WATER RESOURCES DATA FOR NEW YORK WATER YEAR 1976 VOLUME 1. NEW YORK EXCLUDING
LONG ISLAND;
(1976) US DEPT OF INTERIOR GEOLOGICAL SURVEY, 615P;
NY; HYDROLOGY; GROUND WATER; WATER QUALITY; LAKES; VELOCITY; RESERVOIRS;
ANALYSIS; SEDIMENT; WATER; CHEMISTRY; TEMPERATURE; WATER LEVELS;
US-IG-WRD-NY-76-1; GCODE4G3T4; GCODE4G5T3S2; GCODE4G5T3S3; GCODE4G5T3S1;
GCODE5A4T3; GCODE5A4T3S1; GCODE5A4T3S3; GCODE5A4T3S2; GCODE5A4T3S10; GCODE5B4T3;
GCODE5C2T5; GCODE5C2T6; GCODE5D3T4; GCODE5D4T1;

608 US DEPT OF INTERIOR OFFICE OF WATER RESOURCES RESEARCH;
LAKE ONTARIO - A BIBLIOGRAPHY;
(1972) US DEPT. OF INTERIOR. WATER RESOURCES SCIENTIFIC INFORMATION CENTER
REPORT WRSIC 72-212;
BIBLIOGRAPHY; HYDROLOGY; EUTROPHICATION; WATER QUALITY; LAKES; POLLUTION;
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BIBLIOGRAPHIES IN WATER RESOURCES PRODUCED WHOLLY FROM THE INFORMATION BASE
COMPRISING SELECTED WATER RESOURCES ABSTRACTS (SWRA). AT THE TIME OF SEARCH FOR
THIS BIBLIOGRAPHY, THE DATA BASE HAD 41,521 ABSTRACTS COVERING SWRA THROUGH MAY
15, 1972 (VOLUME 5, NUMBER 10). A DESCRIPTOR INDEX IS MADE UP OF A FRACTION OF
THE TOTAL DESCRIPTORS AND IDENTIFIERS BY WHICH EACH PAPER IN THIS BIBLIOGRAPHY
HAS BEEN INDEXED. THESE DESCRIPTORS REPRESENT WEIGHTED TERMS THAT BEST DESCRIBE
THE INFORMATION CONTENT AND ARE INDICATED BY ASTERISKS. A COMPREHENSIVE INDEX
REPRESENTS ALL OF THE DESCRIPTORS AND IDENTIFIERS BY WHICH EACH PAPER IN THIS
BIBLIOGRAPHY HAS BEEN INDEXED. THROUGH PERMUTATION, EACH WORD IN A MULTIPLE-WORD
DESCRIPTOR OR IDENTIFIER IS MADE TO FILE IN ITS NORMAL ALPHABETIC ORDER, THUS
AFFORDING A MULTIPLE ACCESS TO EACH ABSTRACT. ANOTHER INDEX LISTS THE AUTHORS
ALPHABETICALLY AND GIVES THE PAGE NUMBERS FOR ABSTRACTS. ABSTRACTS WITH FULL
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ABUNDANCE; SPECIES
DIVERSITY;
US-EPA-660/3-70-021; GCODE5A4; GCODE5A4T3; GCODE5B2; GCODE5C2T5; GCODE5C5;
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POLLUTION; URBAN RUNOFF; CHLORIDE; POTASSIUM; SODIUM; CALCIUM; MAGNESIUM; IRON;
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HARDNESS; HERBICIDES; AMMONIA; NITRATE ; NITRITE ; PHOSPHORUS; OIL; PH; PHENOLS;
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GCODE6; GCODE5; GCODE4; GCODE3; GCODE2; GCODE1; GCODE2E1T1; GCODE2B3T4;
GCODE3C1T2; GCODE2E1T2; GCODE2B3T4; GCODE2C1T2; GCODE2C2T3; GCODE2M5T3;
GCODE2G4T2; GCODE2G2T3; GCODE2G3T3; GCODE2B1T3; GCODE2B2T; GCODE2F5T2;
GCODE2A1T1; GCODE2A2T1; GCODE2A2T2; GCODE2B4T1; GCODE2A4T3; GCODE1L3T1;
GCODE1A1T3; GCODE1C2T3; GCODE1J4T2; GCODE1N1T4; GCODE1D4T3; GCODE1M4T4;
GCODE1E3T1; GCODE1C1T3; GCODE1A5T5; GCODE1B6T2; GCODE2G4T2; GCODE3C2T6;
GCODE3F5T2; GCODE3J1T2; GCODE3F6T2; GCODE3B4T2; GCODE3C4T1; GCODE3A4T1;
GCODE3C1T3; GCODE3C2T1; GCODE3K4T1; GCODE3K4T2; GCODE3B6T3; GCODE3H3T4;
GCODE3C2T5; GCODE3J1T1; GCODE4A2T1; GCODE4F1TI; GCODE4F1T2; GCODE4B1T10;
GCODE4G1T7; GCODE4G3T1; GCODE4A5T3; GCODE4B3T1; GCODE4G3T4; GCODE4A2T5;
GCODE4B2T1; GCODE4A4T1; GCODE4A1T4; GCODE4A1T5; GCODE4B1T4; GCODE4D4T1;
GCODE4G5T3S1; GCODE4B3T3; GCODE4F1T1; GCODE4D2T1; GCODE5D3T4; GCODE5C2T5;
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NATURAL AND CULTURAL CHEMICAL LOADS CAN BE ESTIMATED AND DIFFERENTIATED FOR THE
GREAT LAKES BASIN. SOME MODERN LOADING ESTIMATES ARE OBTAINED THROUGH USE OF
U.S. AND CANADIAN WATER QUALITY DATA FROM POPULATED DRAINAGE BASINS. WHERE
INSUFFICIENT DATA ARE AVAILABLE, LOADS ARE ESTIMATED BY COMPARING THE LITHOLOGY
OF THE SURFICIAL MATERIAL AND THE MATERIAL EXPOSED AT THE PRE-PLEISTOCENE
EROSIONAL SURFACE TO WATER QUALITY AND DISCHARGE DATA FROM STREAMS WITH LITTLE
CULTURAL CONTAMINATION. EXTRAPOLATION IS MADE TO UNSAMPLED BASINS OF SIMILAR
DISCHARGE AND GEOLOGY. CORRELATION STUDIES OF THE RAQUETTE AND MAUMEE RIVERS
EXEMPLIFY THE RESPONSES OF CHEMICAL LOADS TO TEMPORAL CHANGES AND TO LITHOLOGIC
CONTROL AND PROVIDE A BASIS FOR RELATING LOADING TO WEATHERING. NATURAL LOADS
ARE BASED UPON HISTORICAL DATA. CHEMICAL CONSTITUENTS FOR WHICH LOADS ARE
ESTIMATED INCLUDE: TOTAL DISSOLVED SOLIDS (TDS), C1-, PO4 E-3, CA E+2 AND
SIO2AQ. THE LOADING RATES OF CA E+2 AND SIO2AQ. THE LOADING RATES OF CA+2 AND
SIO2 SSAQ REFLECT LITHOLOGIC SOURCE MATERIALS, CA+2 LOADING FROM CARBONATE
TERRANES IN THE ERIE AND ONTARIO DRAINAGE BASINS, AND SIO2AQ LOADING IN THOSE
BASINS WHERE IGNEOUS AND METAMORPHIC ROCKS PREVAIL. TDS, C1- AND PO4 E-3 REFLECT
URBAN AND AGRICULTURAL LOADS WHICH ARE IMPORTANT IN LAKES MICHIGAN, ERIE AND
ONTARIO. (KEY WORDS; CHEMICAL LOADING, WEATHERING, LITHOFACIES, GREAT LAKES,
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3005; GCODE6; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5;
THE GREAT LAKES BASIN COMMISSION HAS INITIATED A FRAMEWORK STUDY TO ASSESS THE
PRESENT AND PROJECTED WATER- AND RELATED LAND-RESOURCE PROBLEMS AND DEMANDS IN
THE GREAT LAKES BASIN. POORLY DEFINED OBJECTIVES, INCOMPLETE AND INCONSISTENT
DATA ARRAYS; UNKNOWN AIR, BIOTA, WATER, AND SEDIMENT INTERACTIONS; AND MULTIPLE
PLANNING CONSIDERATIONS FOR INTERCONNECTED, LARGE LAKE SYSTEMS HINDER OBJECTIVE
PLANNING. TO INCORPORATE MATHEMATICAL MODELING AS A PLANNING TOOL FOR THE GREAT

LAKES, A TWO-PHASE PROGRAM, COMPRISING A FEASIBILITY AND DESIGN STUDY FOLLOWED BY CONTRACTED AND IN-HOUSE MODELING, DATA ASSEMBLY, AND PLAN DEVELOPMENT, HAS BEEN INITIATED. THE MODELS WILL BE USED TO IDENTIFY SENSITIVITIES OF THE LAKES TO PLANNING AND MANAGEMENT ALTERNATIVES, INSUFFICIENCIES IN THE DATA BASE, AND INADEQUATELY UNDERSTOOD ECOSYSTEM INTERACTIONS. FOR THE FIRST TIME OBJECTIVE TESTING OF RESOURCE-UTILIZATION PLANS TO IDENTIFY POTENTIAL CONFLICTS WILL PROVIDE A RATIONAL AND COST-EFFECTIVE APPROACH TO GREAT LAKES MANAGEMENT. BECAUSE DISCIPLINES WILL BE INTERRELATED, THE LONG-TERM EFFECTS OF PLANNING ALTERNATIVES AND THEIR IMPACTS ON NEIGHBORING LAKES AND STATES CAN BE EVALUATED. TESTING OF THE CONSEQUENCES OF ENVIRONMENTAL ACCIDENTS AND INCREASED POLLUTION LEVELS CAN BE EVALUATED, AND RISKS TO THE RESOURCE DETERMINED. EXAMPLES ARE CITED TO DEMONSTRATE THE USE OF SUCH PLANNING TOOLS.

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THE GREAT LAKES-ILLINOIS RIVER BASINS PROJECT HAS COMPLETED FIELD STUDIES ON CURRENTS IN LAKES MICHIGAN, ERIE, AND ONTARIO. ONE OF THE DOMINANT EFFECTS APPEARS TO BE THAT THE EARTH'S ROTATION PRODUCES RIGHT HAND ACCELERATION TO THE CURRENTS. THE EFFECT OF THE EARTH'S ROTATION WATER MOVEMENTS IN THE GREAT LAKES HAS BEEN PORTRAYED IN A FILM. 5 PATTERNS OF FLOW ARE DISPLAYED: STRAIGHT-LINE FLOW, SINUSOIDAL OR OSCILLATORY, HALF MOON, CIRCULAR OR SPIRAL, AND ROTARY OR SCREW. INERTIAL FLOW IS FOUND IN THE GREAT LAKES AT ALL DEPTHS AND IN ALL SEASONS AS WELL AS UNDER ICE COVER. WITH FEW EXCEPTIONS, SUCH AS THE STRAITS OF MACKINAC AND SHALLOW INSHORE STATIONS, SOME TYPE OF INERTIAL FLOW IS EVIDENT IN THE LAKES;

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STEPHANODISCUS; MELOSIRA; FRAGILARIA; TABELLARIA; DIATOMA;
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GCODE5; GCODE4; GCODE3; GCODE2; GCODE1; GCODE6; 4671;
SPECIES COMPOSITION OF PHYTOPLANKTON IN THE LAURENTIAN GREAT LAKES, ITS BIOMASS CONCENTRATION, AND ITS PHYSIOLOGICAL ACTIVITY MEASURED AS PHOTOSYNTHESIS RELATED TO EUTROPHICATION, ARE REVIEWED AND DISCUSSED.;

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NOAA WAS ORGANIZED BY THE PRESIDENT IN HIS REORGANIZATION PLAN NO. 4. THE MAJOR COMPONANTS OF NOAA ARE: NATIONAL MARINE FISHERIES SERVICE, NATIONAL WEATHER SERVICE, NATIONAL OCEAN SURVEY, ENVIRONMENTAL RESEARCH LABORATORIES, ENVIRONMENTAL DATA SERVICE, NATIONAL ENVIRONMENTAL SATELLITE SERVICE, AND THE OFFICE OF SEA GRANT. NOAA IS THE US LEAD AGENCY FOR IFYGL. THE MERITIME ADMINISTRATION OF THE DEPT OF COMMERCE, THROUGH ITS PROGRAMS FOR IMPROVING NAVIGATION AIDS AND SHIP DESIGN UNDER ICE CONDITIONS, FACILITATES GREAT LAKES TRANSPORT AND TRADE.;

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THE DEPT OF AGRICULTURE AND COOPERATING INSTITUTIONS HAVE RESPONSIBILITIES FOR RESEARCH ON THE PREVENTION AND CONTROL OF AGRICULTURAL AND FORESTRY SOURCES OF POLLUTION. A WIDE VARIETY OF RESEARCH PROJECTS RELATE TO OPTIMUM USE OF AGRICULTURAL CHEMICALS WITH MINIMAL ADVERSE ENVIRONMENTAL IMPACT, TO ENVIRONMENTALLY SAFE ANIMAL AND FOOD PROCESSING, WASTE MANAGEMENT, AND TO SOIL AND WATER CONSERVATION FOR MINIMAL SOIL EROSION AND SEDIMENT DEVELOPMENT. ALSO, RESEARCH CONTINUES ON PRINCIPLES OF LAND USE POTENTIAL OF SPECIFIC SITES AS RELATED TO ENVIRONMENTAL IMPACT. MUCH OF THIS RESEARCH HAS DIRECT APPLICATION TO WATER POLLUTION FROM NON-AGRICULTURAL AND FORESTRY SOURCES, FOR EXAMPLE, SEWAGE DISPOSAL ON LAND, EROSION AND SEWAGE MANAGEMENT IN RESORT PLANNING, AND IN GENERAL LAND DEVELOPMENT.;

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5765; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

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ZOOPLANKTON OF THE ST. LAWRENCE GREAT LAKES - SPECIES COMPOSITION, DISTRIBUTION, AND ABUNDANCE;
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ZOOPLANKTON; DISTRIBUTION; ARTHROPODA; DATA PROCESSING; CLUSTER ANALYSIS; CHLOROPHYLL-A;
GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; 4694;
RECENT STUDIES OF ZOOPLANKTON OF THE ST. LAWRENCE GREAT LAKES HAVE CONCENTRATED ON A BROAD SYNOPTIC COVERAGE OF SAMPLING STATIONS AND REPEATED CRUISES THROUGHOUT A GROWING SEASON. THIS HAS RESULTED IN A CONSIDERABLE AMOUNT OF DETAIL ABOUT SEASONAL CHANGES IN SPECIES COMPOSITION, TOTAL NUMBERS, AND VERTICAL AND HORIZONTAL DISTRIBUTIONS. INVESTIGATORS HAVE TREATED THE DATA TO SHOW DIFFERENCES IN DISTRIBUTION OVER THE LAKES ON A CRUISE AND CRUISE MEAN AVERAGES FOR EACH LAKE, OFTEN WEIGHTED BY AREA TO PROVIDE RELATIVE ABUNDANCE FIGURES OVER THE SEASON AND BETWEEN LAKES. MAXIMUM NUMBERS WERE OBSERVED IN LAKE ERIE (225,000/MEXP3). CONSIDERABLY FEWER ORGANISMS WERE FOUND IN PERIODS OF PEAK ABUNDANCE IN LAKE ONTARIO (55,000/MEXP3) AND LAKE HURON (22,000/MEXP3). NO FIRM ESTIMATES ARE AVAILABLE FOR LAKE SUPERIOR BUT NUMBERS FROM ONE CRUISE (8000/MEXP3) INDICATE STILL LOWER VALUES THERE. BIOMASS ESTIMATES (EITHER AS ASH-FREE WEIGHT OF MATERIAL FROM PLANKTON NET HAULS OR FROM CONVERSIONS OF NUMBERS TO BIOMASS FROM DRY WEIGHT FACTORS FOR INDIVIDUAL SPECIES) ARE HIGHEST FOR LAKE ERIE, BUT REFLECT THE LARGER SIZE OF ORGANISMS IN THE OTHER LAKES, ESPECIALLY HURON AND SUPERIOR. SPECIES DISTRIBUTIONS ARE NOW REASONABLY WELL KNOWN FOR CRUSTACEANS, EXCEPT IN ONE OR TWO TAXA OF THE CLADOCERANS DAPHNIA AND BOSMINA WHOSE VARIABILITY SHOULD BE INVESTIGATED MORE FULLY. RECENT STUDIES HAVE BEEN MADE ON THE ROTIFERS, BUT THEIR NUMBERS, DISTRIBUTION, AND ECOLOGICAL ROLE IS NOT FULLY DEFINED. SIMILARLY, THE DISTRIBUTION AND ROLE OF PROTOZOAN GROUPS HAVE BEEN LARGELY IGNORED. SEVERAL COMPUTER TECHNIQUES ARE SUGGESTED FOR THE HANDLING AND ANALYSIS OF THE LARGE QUANTITIES OF DATA GENERATED ON LAKEWIDE SURVEYS INCLUDING COMMUNITY COEFFICIENTS AND CLUSTER ANALYSES. MORE ATTENTION SHOULD BE GIVEN TO DETERMINING SAMPLING INTERVALS TO OBTAIN INFORMATION WHICH CAN PRECISELY DETECT CHANGES IN ABUNDANCE FROM YEAR TO YEAR, AND BETTER POPULATION DYNAMICS AND PRODUCTION DATA ARE NEEDED TO RELATE ZOOPLANKTON STOCKS TO EUTROPHICATION.;

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(1974) JOURNAL OF THE FISHERIES RESEARCH BOARD OF CANADA, VOL. 31, NO. 3, PP. 309-317;

ZOOPLANKTON; ARTHROPODA; BIOMASS; CYCLOPOIDA; COPEPODA; CHLOROPHYLL-A;
GCODE3; GCODE4; GCODE5; 4695;
CRUSTACEAN ZOOPLANKTON CONCENTRATIONS (NUMBERS PER MEXP3) IN THE UPPER 50 M FOUND IN LAKEWIDE CRUISES DURING ALL OR MOST OF THE SEASONS ON LAKES ONTARIO AND ERIE IN 1970 AND ON LAKE HURON IN 1971 SHOWED THAT THE SPECIES OF ZOOPLANKTON CRUSTACEANS PRESENT IN THE THREE LAKES WERE GENERALLY IDENTICAL, ALTHOUGH THE TIMES OF MAXIMA AND RELATIVE SPECIES COMPOSITIONS DIFFERED. CALANOID COPEPODS WERE MOST ABUNDANT AND DIVERSE IN LAKE HURON AND WESTERN LAKE ERIE. CYCLOPOIDS AND CLADOCERANS WERE MOST ABUNDANT IN LAKES ERIE AND ONTARIO AND IN THE SAGINAW BAY REGION OF LAKE HURON. THE MOST ABUNDANT CYCLOPOID THROUGHOUT THE YEAR IN ALL THREE LAKES WAS DIACYCLOPS BICUSPIDATUS THOMASI; TROPOCYCLOPS PRASINUS AND ACANTHOCYCLOPS VERNALIS WERE ABUNDANT ESPECIALLY IN LAKES ONTARIO AND ERIE, RESPECTIVELY. CLADOCERANS WERE MOST NUMEROUS IN LAKES ERIE AND ONTARIO. NUMBERS OF INDIVIDUALS FLUCTUATED MARKEDLY THROUGH THE SEASON WITH MAXIMA IN THE SPRING OR SUMMER MONTHS IN ALL THREE LAKES. BIOMASS VALUES (ASH-FREE DRY WEIGHT) WERE HIGHEST IN LAKE ERIE, ESPECIALLY THE WESTERN BASIN, AND IN SAGINAW BAY OF LAKE HURON. ALTHOUGH NUMBERS OF CRUSTACEANS/MEXP3 WERE MUCH LOWER IN LAKE HURON THAN IN LAKE ONTARIO, NET BIOMASS VALUES WERE SIMILAR. THIS WAS DUE TO THE GREATER SIZE AND AVERAGE WEIGHT OF CRUSTACEANS IN LAKE HURON SAMPLES. INSHORE WATERS OF LAKES ONTARIO AND HURON AND ALL THREE BASINS OF LAKE ERIE WERE SUBJECT TO GREATER FLUCTUATIONS IN CONCENTRATIONS OF CRUSTACEAN ZOOPLANKTON AND NET BIOMASS VALUES THAN IN THE PELAGIC WATERS OF LAKES ONTARIO AND HURON.;

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MEAN MONTHLY SURFACE TEMPERATURES OF LAKE ONTARIO FROM APRIL 1972 TO MARCH 1973 (IFYGL);
(1974) PROCEEDINGS, 17TH CONFERENCE INTERNATIONAL ASSOC. GREAT LAKES RESEARCH, PP. 471-482;
TEMPERATURE; THERMOMETERS; REMOTE SENSING;
GCODE5; 4695;
FROM APRIL 1972 THROUGH MARCH 1973 INCLUSIVE, 47 AIRBORNE RADIATION THERMOMETER (ART) SURVEYS OF THE SURFACE TEMPERATURE OF LAKE ONTARIO WERE MADE BY THE ATMOSPHERIC ENVIRONMENT SERVICE. A MEAN SURFACE TEMPERATURE WAS DETERMINED FOR EACH MONTH AS WELL AS MAPS OF SPATIAL VARIATIONS. LAKE SURFACE TEMPERATURES WERE FOUND TO BE COOLER THAN THE CORRESPONDING 1960-71 NORMAL VALUES IN ALL BUT THREE MONTHS. ON THREE OCCASIONS (JUNE, JULY AND OCTOBER) SURFACE TEMPERATURES WERE ABOUT 2 DEG. C BELOW THE NORMAL. IN ALL MONTHS, MEAN SPATIAL PATTERNS OF SURFACE TEMPERATURES CLOSELY RESEMBLED THOSE OF THE NORMAL.;

632 WEBB, MICHAEL S.;
MONTHLY MEAN SURFACE TEMPERATURES FOR LAKE ONTARIO AS DETERMINED BY AERIAL SURVEY;
(1970) WATER RESOURCES RESEARCH, VOL. 6, NO. 3, PP943-956;
LAKES; TEMPERATURE; WATER; AERIAL PHOTOGRAPHY;
2216; GCODE5;
FOR CALCULATIONS OF EVAPORATION LOSSES BY MASS TRANSFER TECHNIQUES, AND FOR MANY OTHER RESEARCH AND OPERATIONAL APPLICATIONS, IT IS NECESSARY TO KNOW THE MEAN PATTERNS OF SURFACE WATER TEMPERATURE. THE WORK OF MILLAR (1952) HAS BEEN WIDELY USED WHENEVER SUCH INFORMATION IS REQUIRED FOR THE GREAT LAKES. THIS PAPER PRESENTS PRELIMINARY PATTERNS OF MONTHLY MEAN SURFACE WATER TEMPERATURES FOR LAKE ONTARIO BASED ON 36 AIRBORNE RADIATION THERMOMETER SURVEYS OVER A THREE-YEAR PERIOD. TEMPERATURE VALUES AT EACH OF THE 69 POINTS IN A GRID HAVE BEEN PLOTTED AGAINST CALENDAR DATE, AND AN ANNUAL TEMPERATURE CURVE HAS BEEN PRODUCED FOR EACH POINT. VALUES FOR THE MIDDLE OF EACH MONTH HAVE BEEN DETERMINED BY INTERPOLATION, AND USED TO PRODUCE A PATTERN FOR EACH MONTH. THE PATTERNS ARE BRIEFLY COMPARED WITH MILLAR'S. OVER THE NEXT FEW YEARS AS THE AIRBORNE RADIATION THERMOMETER (ART) SURVEYS CONTINUE TO ADD TO THE DATA BANK, IT IS PLANNED TO UPDATE THESE ANALYSES. THEREFORE THESE MONTHLY VALUES MUST BE CONSIDERED TENTATIVE AT THIS TIME;

633 WEBB, WILLIAM L; BART, JONATHAN R; KOMAREK, CONSTANCE A;
WILDLIFE RESOURCES;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 65P;

WILDLIFE; ENDANGERED SPECIES; MIGRATION; AVES; WETLANDS; CHELONIA; REPTILIA; RANA; AMPHIBIANS; ANATIDAE; COLYMBIDAE; ANSERINAE;
SLE-ST2; GCODE504; GCODE505; GCODE7;
THE ST LAWRENCE-EASTERN ONTARIO SHORELINE HAS AN APPEAL WHICH IS OBVIOUS TO EVERY VISITOR. THIS APPEAL IS MADE UP OF A LARGE NUMBER OF COMPONENTS, EACH OF WHICH ADDS A FACET TO THE TOTAL. NO FACET CAN BE IDENTIFIED AS THE SINGLE FEATURE WHICH MAKES THE AREA ATTRACTIVE. THE WILDLIFE AND WILDLIFE HABITATS ARE CERTAINLY 1 OF THE IMPORTANT COMPONENTS, AND CONTRIBUTE SIGNIFICANTLY TO THE OVERALL TOTAL VALUE OF THE REGION. EFFORTS MUST BE MADE TO PRESERVE AND DEVELOP THESE WILDLIFE RESOURCES OR A SIGNIFICANT ELEMENT OF ENVIRONMENTAL QUALITY WILL BE DAMAGED OR DESTROYED. IN THIS REPORT THE PRINCIPAL WILDLIFE SPECIES OF THE REGION ARE LISTED; RARE AND ENDANGERED SPECIES ARE IDENTIFIED, AND THE UNIQUE AND IMPORTANT WILDLIFE HABITATS (BIOLOGICALLY PRODUCTIVE, ECONOMICALLY AND ESTHETICALLY VALUABLE) OF THE NARROW SHORELINE STRIP ARE LOCATED. THE REPORT IS INTENDED AS A STARTING POINT FOR PUBLIC DISCUSSION AND FOR MORE DETAILED STUDIES. AS THE DISCUSSIONS AND STUDIES ARE CONTINUED, A COMPREHENSIVE LAND-USE PLAN MUST EMERGE TO PREVENT UNCONTROLLED DEVELOPMENT WITH CONSEQUENT DESTRUCTION OF THE VERY CHARACTERISTICS WHICH AT ONE TIME MADE THE AREA A TRULY OUTSTANDING JEWEL OF THE CONTINENT. IN RECENT YEARS THE AMERICAN PUBLIC HAS BEGUN TO RECOGNIZE THE VALUE OF WILDLIFE AND TO BELIEVE THAT PRESERVATION OF WILD CREATURES AND THEIR HABITAT IS WORTHWHILE. IN FUTURE YEARS THIS CHANGE OF ATTITUDE WILL ACCELERATE. MORE PERSONS WILL SEEK OPPORTUNITIES TO STUDY NATURE AND ECOLOGY PARTLY TO ESCAPE FROM THEIR CROWDED URBAN ENVIRONMENT AND PARTLY TO USE THEIR INCREASED LEISURE IN A STIMULATING WAY. THIS USE OF WILDLIFE HAS BEEN CALLED "NON-CONSUMPTIVE", I.E., THE ANIMAL IS NOT CONSUMED IN THE PROCESS OF USE. THERE IS GREAT OPPORTUNITY FOR DEVELOPMENT OF NON-CONSUMPTIVE USES OF WILDLIFE IN THE ST LAWRENCE-EASTERN ONTARIO REGION. THIS REPORT MAKES AN ORIGINAL PROPOSAL FOR MEETING THIS OPPORTUNITY. THE PROPOSAL IS TO ESTABLISH A SYSTEM OF INTERPRETIVE AREAS TO BE DEVELOPED LIKE A "STRING OF BEADS" ALONG THE SHORELINE. EACH "BEAD" ON THE SHORELINE "STRING" WOULD BE DEVELOPED TO PRESENT SPECIFIC INFORMATION ABOUT THE ENVIRONMENT: NATURAL HISTORY, ECOLOGY, GEOLOGY, OR HUMAN HISTORY. THESE PRESENTATIONS WOULD BE MADE IN AN ACTUAL REAL-LIFE SETTING WHERE LEARNING IS PLEASANT AND THOROUGH. THE SYSTEM CONCEPT WOULD DRAW PEOPLE FROM ONE "BEAD" TO ANOTHER AND THUS ENCOURAGE LEARNING THE WHOLE STORY BY TRAVERSING THE ENTIRE LENGTH OF THE SHORELINE "STRING". IF ADOPTED, THIS SYSTEM WOULD PAY LARGE DIVIDENDS BY HELPING VISITORS AND AREA RESIDENTS LEARN ABOUT THE WORLD IN WHICH THEY LIVE. IT WOULD ALSO PAY SUBSTANTIAL ECONOMIC DIVIDENDS BECAUSE MORE VISITORS WOULD BE ATTRACTED TO THE REGION, THEY WOULD BE ENCOURAGED TO RETURN MORE OFTEN, AND THEY WOULD REMAIN LONGER BECAUSE OF THE INTELLECTUAL STIMULATION RECEIVED IN A PLEASANT AND RELAXING ENVIRONMENT;

634 WEIKMANN, HELMUT K.;
MAN-MADE WEATHER PATTERNS IN THE GREAT LAKES BASIN;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP205-219;
METEOROLOGY; WEATHER MODIFICATION;
US-FCS-P1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
FOR THE PAST 5 YRS NOAA HAS STUDIED THE WEATHER MODIFICATION POTENTIAL OF THE GREAT LAKES REGION. NUMEROUS OBSERVATIONS OF ARTIFICIAL RAIN AND SNOWFALL HAVE BEEN MADE IN THE BUFFALO REGION OF LAKE ERIE. CLIMATOLOGICALLY, THE GREAT LAKES REGION IS PECULIAR IN THAT ITS NUMEROUS RELATIONSHIPS BETWEEN THE WATER SURFACES AND THE AIR EXERT PARTICULARLY STRONG INFLUENCES IN THE ATMOSPHERIC BOUNDARY LAYER. IN WINTER THE ENTIRE GREAT LAKES BASIN HAS A HIGH FREQUENCY OF SHALLOW CLOUD LAYERS WHICH, UPON TRAVELING ACROSS THE STILL UNFROZEN AND WARM LAKES, FORM THE BASIC INGREDIENT FOR THE DEVELOPMENT OF LAKE STORMS. THE BASIN IS THE SEAT OF MANY INDUSTRIES WHOSE POLLUTION POTENTIAL NOT ONLY AFFECTS THE HYDROLOGY AND ECOLOGY BUT ALSO THE WEATHER. THE SHALLOW CLOUD LAYERS OCCUR WITH SUFFICIENT DEPTH TO PRESENT A FAVORABLE PRECIPITATION POTENTIAL BUT THEY ARE FREQUENTLY NOT COLD ENOUGH TO PRODUCE ICE CRYSTALS NATURALLY. CONSEQUENTLY, THESE CLOUD SYSTEMS CONSTITUTE A SOURCE OF ARTIFICIAL PRECIPITATION WHICH IS SO FAR UNEXPLOITED. SEEDING APPLICATIONS ARE BEING DISCUSSED.;

635 WEILER, ROLAND R.;
CARBON DIOXIDE EXCHANGE AND PRODUCTIVITY IN LAKE ERIE AND LAKE ONTARIO;
(1975) INTERNAT ASSOC OF THEORETICAL AND APPLIED LIMNOLOGY PROC CONGRESS IN

CANADA V 19, PP694-704;
CARBON DIOXIDE; ALKALINITY; INORGANIC CARBON; PH; MATHEMATICAL MODELS; AIR-SEA MIXING;
ITL-C-1974-F1; GCCDE4; GCCDE5;

836 WEILER, ROLAND R.;
THE INTERSTITIAL WATER COMPOSITION IN THE SEDIMENTS OF THE GREAT LAKES. I. WESTERN LAKE ONTARIO;
(1973) LIMNOL & OCEAN 18(6);918-931;
SEDIMENT; INTERSTITIAL WATER; CHEMICAL COMPOSITION; REDOX POTENTIAL; PH; NUTRIENTS;
GCCDE5A;
4 STATIONS IN THE WESTERN END OF LAKE ONTARIO WERE CORED AND THE INTERSTITIAL WATER TOGETHER WITH THE WATER LYING IMMEDIATELY ABOVE IT WERE ANALYZED FOR THE MAJOR IONS, SOLUBLE REACTIVE PHOSPHATE, NITRATE, SILICA, IRON, AND MANGANESE. THE INTERSTICIAL WATERS ARE ENRICHED RELATIVE TO LAKE WATERS IN ALL COMPONENTS EXCEPT CHLORIDE, FLUORIDE AND SODIUM AND STRONGLY DEPLETED WITH RESPECT TO SULFATE. THE EH WAS GENERALLY NEGATIVE AND THE PH WAS AROUND 7.4. NO CHANGES FROM MAY TO AUGUST COULD BE OBSERVED, BUT IN MOST CASES, SILICA, ALKALINITY, MANGANESE, AND IRON INCREASED WITH DEPTH IN THE SEDIMENT; CHLORIDE, FLUORIDE, SULFATE, SODIUM, AND CALCIUM DECREASED AND THE OTHER PARAMETERS REMAINED MORE OR LESS CONSTANT. THE MAJOR FACTORS GOVERNING THE CHEMISTRY OF THE INTERSTITIAL WATERS WERE DIFFUSION, BACTERIAL REDUCTION OF SULFATE, AND EQUILIBRIUM WITH VARIOUS MINERALS IN THE SEDIMENTS. THERE IS EVIDENCE THAT THE IRON CONCENTRATION IS GOVERNED BY FECO3 BUT NO FIRM CONCLUSIONS CAN BE DRAWN CONCERNING MANGANESE.;

837 WEILER, ROLAND R.; CHAWLA, VINOD K.;
DISSOLVED MINERAL QUALITY OF GREAT LAKES WATERS;
(1969) PROC. 12TH CONF. GREAT LAKES RES. PP801-818;
CHROMIUM; MANGANESE; TOTAL DISSOLVED SOLIDS; SODIUM; POTASSIUM; CALCIUM; SULPHATE; CHLORIDE; ZINC; COPPER; LEAD; IRON; NICKEL; STRONTIUM; WATER QUALITY;
1600; GCCDE1; GCCDE3; GCCDE4; GCCDE5; GCCDE6;
IN 1968 THE CANADA CENTRE FOR INLAND WATERS (CCIW) UNDERTOOK A SYSTEMATIC MONITORING OF LAKES ONTARIO, ERIE, HURON AND SUPERIOR IN A STUDY OF THE MAJOR (CA, MG, NA, K, SO4, CL, HCO3, AND F) AND TRACE (ZN, CU, PB, FE, NI, CR, MN AND SR) ELEMENTS. THE DATA GATHERED ON MAJOR ELEMENTS DURING THE PERIOD JULY TO NOVEMBER 1968 WERE EXAMINED AND THE RESULTS COMPARED ON A LAKE-WIDE BASIS WITH EARLIER COMPILATIONS TO APPRAISE RECENT TRENDS AND CHANGES IN THE COMPOSITION OF THESE WATERS. LAKE-WIDE COMPARISON OF THE TRACE ELEMENT COMPOSITIONS OF THE GREAT LAKES WATERS IS DISCUSSED;

838 WELLS, LARUE;
FISHERY SURVEY OF U.S. WATERS OF LAKE ONTARIO;
(1969) GREAT LAKES FISHERY COMMISSION. TECHNICAL REPORT NO. 14. PP. 51-57.;
FISHERIES; FISH; COREGONUS; COTTIDAE; ALOSA PSEUDOHARENGUS; OSMERUS; NOTROPIS; PERCOPSIDAE;
GLF-TR14; GCCDE5;
GILL NETS AND TRAWLS WERE FISHED BY THE BUREAU OF COMMERCIAL FISHERIES R/V CISCO DURING SEPTEMBER 19-23, 1964, AT SEVERAL LOCATIONS AND DEPTHS IN THE OFFSHORE UNITED STATES WATERS OF LAKE ONTARIO. WATER TEMPERATURES WERE LOW (3.7-6.3 DEG. C) AT ALL FISHING STATIONS EXCEPT ONE (16.4 DEG C). SUPPLEMENTARY DATA WERE PROVIDED BY THE BUREAU'S R/V KAHO IN 1966. ALEWIVES AND SMELT WERE COMMON. CISCOES WERE EXTREMELY SCARCE, BUT LARGE; MOST OF THOSE CAUGHT WERE BLOATERS. SLIMY SCULPINS WERE ABUNDANT, BUT NO DEEPWATER SCULPINS WERE CAUGHT. YELLOW PERCH WERE SCARCE. ALTHOUGH THE WARM WATER SPECIES WERE INADEQUATELY SAMPLED, TROUT-PERCH SEEMED TO BE ABUNDANT. OTHER SPECIES, ALL CAUGHT IN SMALL NUMBERS, WERE LAKE TROUT, SPOTTAIL SHINERS, BURBOT, THREESPINE STICKLEBACKS, AND JOHNNY DARTERS FROM COLD WATER AND NORTHERN PIKE, LAKE CHUBS, WHITE SUCKERS, WHITE BASS, WHITE PERCH, AND ROCK BASS FROM WARM WATER.;

839 WELSH, JAMES P., JR.;
ICE PROPERTIES AND THEIR RELATION TO SHIP TRANSIT IN THE GREAT LAKES;
(1972) PROC 1ST FEDERAL CONF ON THE GREAT LAKES, PP274-287;
ICE-SNOW PHYSICAL PROPERTIES; NAVIGATION; ICE;

US-FCS-P1972; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6; GCODE7;
ADEQUATE INFORMATION ON THE PHYSICAL PROPERTIES OF LAKE ICE RELEVANT TO THE SHIP-ICE INTERACTION FOR DOMESTIC ICE BREAKER ENGINEERING IS NOT PRESENTLY AVAILABLE. IN RESPONSE TO THIS NEED THE COAST GUARD ICE RESEARCH PROGRAM IS DIRECTLY CONCERNED WITH THE IDENTIFICATION AND QUANTIFICATION OF THE PHYSICAL PROPERTIES OF ICE WHICH AFFECT SHIP TRANSIT. PHYSICAL PROPERTIES, SUCH AS THE FLEXURAL STRENGTH, COEFFICIENTS OF STATIC AND KINETIC FRICTION, DENSITY, THERMAL CHARACTERISTICS OF THE ICE COLUMN, AND THE AREAL DISTRIBUTION AND THICKNESS ARE THE PROPERTIES PRESENTLY UNDER INVESTIGATION.;

640 WELSH, MATTHEW E.;
INTERNATIONAL PUBLIC MEETING ON POLLUTION OF NIAGARA RIVER AT CITY HALL, NIAGARA FALLS, NY;
(1968) INTERNATIONAL JOINT COMMISSION, PP. 1-6;
POLLUTION;
GCODE5A4T3; 4911;

641 WERNER, ROBERT G.;
CURRENT LEVEL OF TAXONOMIC INFORMATION ON GREAT LAKES FISH EGGS AND LARVAE;
(1976) US FISH AND WILDLIFE SERVICE PROC OF A WORKSHOP, PP6-16;
TAXONOMY; EGGS; LARVAE; FISH;
US-IF-01; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;

642 WERNER, ROBERT G.;
ICTHYOPLANKTON AND INSHORE LARVAL FISHES OF THE ST. LAWRENCE RIVER;
(1977) GEIS, JAMES W., ED., PRELIMINARY REPORT: BIOLOGICAL CHARACTERISTICS OF THE ST. LAWRENCE RIVER, SUC ENVIRONMENTAL SCIENCE AND FORESTRY, PP31-60;
FISH; LARVAL; IDENTIFICATION;
NY-US-PR-SL; GCODE7;

643 WERNER, ROBERT G.;
A PRELIMINARY ANNOTATED BIBLIOGRAPHY OF THE LITERATURE RELAVENT TO DESCRIPTIONS OF EGGS AND LARVAL STAGES OF FISH OF THE GREAT LAKES;
(1976) US FISH AND WILDLIFE SERVICE PROC OF A WORKSHOP APPENDIX I, PP107-200;
BIBLIOGRAPHY; FISH; EGGS; LARVAE;
US-IF-01; GCODE1; GCODE2; GCODE3; GCODE4, GCODE5; GCODE6;

644 WERNER, ROBERT G; FORD, DENNIS;
FISHERIES;
(1972) ST LAWRENCE-EASTERN ONTARIO COMMISSION SHORELINE STUDY TECHNICAL REPORT, 63P;
FISHERIES; COMMERCIAL FISHERIES; HABITAT; CREEL; FISH; ECONOMICS; RECREATION; PRIMARY PRODUCTIVITY; WETLANDS; SPAWNING; SPECIES DIVERSITY; CREEL CENSUS;
SLE-ST3; GCODE5D4; GCODE5D5; GCODE7;
A STUDY OF THE FISHERIES RESOURCES DEPENDENT ON THE TRIBUTARIES, WETLANDS AND BAYS IN ST LAWRENCE AND JEFFERSON COUNTIES WAS UNDERTAKEN. THE SCOPE OF THIS INVESTIGATION WAS LIMITED TO THE STRIP OF LAND EXTENDING FROM THE SHORELINE INLAND FOR APPROXIMATELY 1 MILE. BACKGROUND INFORMATION WAS OBTAINED FROM PUBLISHED SOURCES, DEC FILES, AND 2 MONTHS OF ON-SITE INVESTIGATION. EACH RESOURCE UNIT WAS EVALUATED ACCORDING TO 2 CRITERIA: (1) PRODUCTIVITY AND (2) IMPORTANCE. 3 LEVELS OF EACH CRITERIA WERE RECOGNIZED: HIGH, MODERATE AND LOW. THE FISHERIES OF THE REGION ARE CHARACTERIZED BY BOTH WARM WATER AND COLD WATER FORMS. COLD WATER FISH HAVE BEEN RECENTLY INTRODUCED IN LAKE ONTARIO AND SHOW PROMISE OF DEVELOPING INTO A SUBSTANTIAL FISHERY. THEIR MANAGEMENT IS CAREFULLY HANDLED BY DEC PERSONNEL. THIS REPORT CONCENTRATES ON THE 11 SPECIES OF WARM WATER FISH'S CONTRIBUTION TO THE ECONOMY OF THE REGION. THE SPORT FISHING OF THE REGION IS ESTIMATED BY DEC AS A MULTIMILLION DOLLAR INDUSTRY. THE COMMERCIAL CATCH FOR THE REGION WOULD PROBABLY EXCEED $75,000 ON AN ANNUAL BASIS. ST LAWRENCE COUNTY IS NOT AS RICH IN FISHERIES RESOURCES AS JEFFERSON COUNTY. IT CONTAINS 1553 ACRES OF WETLAND RESOURCES, OF WHICH 1258 ACRES ARE HIGH PRODUCTIVITY UNITS REQUIRING PROTECTION FROM FURTHER ENCROACHMENT. MODERATE PRODUCTIVITY WETLANDS STAND AT 276 ACRES OF WHICH 40 ACRES ARE ENDANGERED AND REQUIRE PROTECTION. LITTORAL HABITAT IS AT A PREMIUM. JEFFERSON COUNTY IS RICH

IN FISHERIES RESOURCES WITH 21 HIGH PRODUCTION AREAS. IT CONTAINS 12,862 ACRES OF WETLAND WITH 7 UNIQUE HIGH PRODUCTION WETLANDS THAT SHOULD BE PROTECTED. MODERATE PRODUCTIVITY WETLANDS COMPRISE 1,564 ACRES OF WHICH 610 ACRES ARE ENDANGERED. LITTORAL HABITAT SUCH AS THIS IS NOT YET AT A PREMIUM IN THE COUNTY, BUT CONTINUED ENCROACHMENT AND RECREATIONAL DEMANDS COULD SERIOUSLY ALTER THE SITUATION. IMMEDIATE STEPS SHOULD BE TAKEN TO SAFEGUARD THE HIGH PRODUCTIVITY AND ENDANGERED MODERATE PRODUCTIVITY UNITS FROM FURTHER ENCROACHMENT. WATER QUALITY ENHANCEMENT AND WATER LEVEL CONTROL IN WETLANDS WAS ALSO SUGGESTED TO PRESERVE FISHERIES RESOURCES. INLAND DEVELOPMENT COULD LEAD TO DEGRADATION OF THE SHORELINE FISHERIES RESOURCES THROUGH SILTATION, ALTERATION OF DRAINAGE PATTERNS, OR LOWERING OF WATER QUALITY. IN GENERAL, THE FISHERIES OF THE REGION ARE HEALTHY AND VIGOROUS. PRODUCTION SEEMS ABLE TO MEET THE HEAVY FISHING DEMANDS ON THE REGION AND, AT THE SAME TIME, MAINTAIN THE TRADITIONALLY HIGH QUALITY FISHERIES OF THE REGION;

645 WETZEL, ROBERT G.;
FACTORS INFLUENCING PHOTOSYNTHESIS AND EXCRETION OF DISSOLVED ORGANIC MATTER BY AQUATIC MACROPHYTES IN HARD-WATER LAKES;
(1969) VERH. INTERNAT. VEREIN. LIMNOL. VOL. 17, PP72-85;
PHOTOSYNTHESIS; EXCRETION; POTAMOGETON; CARBON; PLANTS; ORGANIC MATTER; MACROPHYTES;
1410; GCODE6;

646 WEZERNAK, CHESTER T; LYZENGA, DAVID R;
ANALYSIS OF CLADOPHORA DISTRIBUTION IN LAKE ONTARIO USING REMOTE SENSING;
(1975) ENVIRONMENTAL RESEARCH INSTITUTE OF MI, 19P;
CLADOPHORA; IFYGL; DISTRIBUTION; COASTAL ZONE; REMOTE SENSING; INSTRUMENTS; MATHEMATICAL MODELS;
3970; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;
MULTISPECTRAL REMOTE SENSING DATA WERE COLLECTED ALONG THE US SHORELINE OF LAKE ONTARIO AS PART OF THE IFYGL PROGRAM. DATA WERE PROCESSED TO SHOW THE DISTRIBUTION OF CLADOPHORA IN THE NEARSHORE ZONE AND TO ESTIMATE THE STANDING CROP. THE PRESENT REPORT DEALS WITH CLADOPHORA DISTRIBUTION IN THE REGION FROM NIAGARA TO ROCHESTER, NY. THE RESULTS SHOW AN EXTENSIVE GROWTH AND DEVELOPMENT OF CLADOPHORA IN THE STUDY AREA. APPROXIMATELY 66% OF THE NEARSHORE ZONE IN THE WESTERN PORTION OF THE LAKE IS COVERED BY CLADOPHORA. THE RESULTS DEMONSTRATE THE POTENTIAL OF REMOTE SENSING TECHNOLOGY FOR DETERMINING THE DISTRIBUTION OF BENTHIC COMMUNITIES;

647 WHITE, MARIAN E.;
THE NIAGARA FRONTIER IROQUOIS ARCHAEOLOGY AND HISTORY;
(1959) SCIENCE ON THE MARCH, 39(6):6P;
HISTORY; MAN;
BUF-BSNS-MC22; GCODE463; GCODE465; GCODE5A4; GCODE5B2; GCODE5B4T1; GCODE465T3; GCODE465T3S1; GCODE465T2;

648 WHITE, MARIAN E.;
A REEXAMINATION OF THE HISTORIC IROQUOIS VAN SON CEMETERY ON GRAND ISLAND;
(1968) BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN 24:1-48;
MAN; HISTORY;
BUF-BSNS-BULL24; GCODE5A4T3;

649 WIGGIN, BARNEY L.;
GREAT SNOWS OF THE GREAT LAKES;
(1950) WEATHERWISE, DEC, PP123-126;
SNOW; STORMS; METEOROLOGY;
2796; GCODE1; GCODE2; GCODE4; GCODE5; GCODE6;

650 WILLFORD, WAYNE A.;
HEAVY METALS RESEARCH IN THE GREAT LAKES 1970-71;
(1971) GREAT LAKES FISHERY LABORATORY CONTRIBUTION 441;
STIZOSTEDION VITREUM; ONCORHYNCHUS; PERCA FLAVESCENS; ROCCUS SAXATILIS; ICTALURUS; APLODINOTUS GRUNNIENS; CYPRINUS; CATOSTOMUS COMMERSONNI; DOROSOMA CEPEDIANUM; MICROPTERUS DOLOMIEUI; OSMERUS MORDAX; FISH; MERCURY; HEAVY METALS;

NOTROPIS; NOTROPIS ATHERINOIDES; ALOSA PSEUDOHARENGUS; ARSENIC; SELENIUM;
2686; GCODE4; GCODE5; GCODE6; GCODE4A;

651 WILLIAMS, SCOTT;
ANALYSIS OF IFYGL RAWINSONDE BASELINE MEASUREMENTS;
(1976) US DEPT OF COMMERCE NOAA TECHNICAL MEMORANDUM EDS-CEDDA-8, PP13;
MEASUREMENT; EVALUATION; METHODS; INSTRUMENTS;
US-CN-ED-TM-CE; GCODE5;
COMPARISONS ARE MADE BETWEEN FACTORY AND FIELD BASELINE MEASUREMENTS OF THE RAWINSONDE INSTRUMENTATION DURING IFYGL IN 1972-73. NO INDEPENDENT CHECK DATA ARE AVAILABLE, BUT IT IS BELIEVED THAT THE COMPARISONS MAKE IT POSSIBLE TO SET A LIMIT ON THE ACCURACY EXPECTED FROM MANUAL BASELINE MEASUREMENTS. A SIMPLER AND MORE ACCURATE BASELINE PROCEDURE IS SUGGESTED.;

652 WILSON, JAMES T.; AYERS, JOHN C.;
AN EFFORT TO MOBILIZE INTER-UNIVERSITY WATER-RELATED RESEARCH IN THE GREAT LAKES;
(1968) PROC GREAT LAKES WATER RESOURCES CONF, PP471-489;
RESEARCH; WATER; EDUCATION;
CAN-EIC-1; GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; GCODE6;
INVESTIGATORS WHO ARE INTERESTED IN WATER-RELATED RESEARCH IN THE GREAT LAKES REGION HAVE CONSIDERABLE RESEARCH REQUIREMENTS AND METHODOLOGIES WITH SPECIAL EMPHASIS ON THE APPLICATION OF SYSTEM ANALYSIS AND MODELING. MULTIDISCIPLINARY REPRESENTATIVES FROM MAJOR MIDWESTERN AMERICAN UNIVERSITIES, WATER RESOURCES CENTERS, AND RELEVANT FEDERAL AGENCIES MET IN MAJOR WORKING CONFERENCES AND ON NUMEROUS OTHER OCCASIONS IN 1967 AND 1968 TO DISCUSS REQUIRED FRAMEWORK RESEARCH ACITIVITIES WHICH APPEAR NECESSARY FOR COMPREHENSIVE WATER MANAGEMENT AND RELATED DEVELOPMENT IN THE GREAT LAKES SYSTEM. THE REPORT DESCRIBES THE FORMAT WHICH PROVIDED AN OPPORTUNITY FOR RESEARCHERS OF MANY DISCIPLINES TO FOCUS UPON SYSTEMS ANALYSIS MODELS OF THE GREAT LAKES. EARLY IN THE STUDY IT WAS DETERMINED THAT A WATER QUANTITY MODEL OF THE ENTIRE SYSTEM IS NECESSARY AND FEASIBLE. ATTEMPTS AT A WATER QUALITY MODEL FOR THE GREAT LAKES REGION IS SUGGESTED ON A SUBREGIONAL, SUBSYSTEM BASIS WITH THE EXPECTATION OF SUBREGIONAL GROUPINGS WHEN DATA AND SYSTEM TECHNOLOGY PERMIT. THE NEED FOR A GAMING-SIMULATION MODEL, A REGIONAL ECONOMIC GROWTH MODEL, A WATER-RELATED DATA INFORMATION SYSTEM, AND INSTITUTIONAL RESEARCH IS EXPRESSED. RESEARCH EFFORTS WHICH SUPPLEMENT AND SUPPORT THE WATER QUANTITY AND WATER QUALITY SUBSYSTEMS ARE ITEMIZED WITH SUGGESTED PRIORITIES. UNDER THE AUSPICES OF THE COMMITTEE ON INSTITUTIONAL COOPERATION, WATER-RELATED RESEARCH REQUIREMENTS IN THE GREAT LAKES REGION HAVE BEEN APPRAISED ON A REGION-WIDE SCALE, AND IT IS HOPED TO PROMOTE MULTIDISCIPLINE - MULTI-UNIVERISTY RESEARCH COLLABORATION NEVER BEFORE ATTEMPTED. THE GRAVITY OF THE WATER POLLUTION PROBLEM IN LOCALIZED AREAS, THE FLUCTUATING LAKE LEVELS, THE SPECTER OF INCREASING WASTE WATER AND RAW WATER TREATMENT COSTS AND THE LACK OF REGION-WIDE GUDIELINES GIVE SPECIAL EMPHASIS TO THE NEED FOR SOPHISTICATED AND SYSTEMATIC RESEARCH WHICH IS DIRECTED TOWARD SERVING HUMAN NEEDS IN THE GREAT LAKES MEGALOPOLIS REGION WHICH IS ANTICIPATED AT THE END OF THE 20TH CENTURY.;

653 WILSON, JAMES W.; POLLOCK, DAVID M.;
PRECIPITATION (RADAR) PROJECT OF THE IFYGL LAKE METEOROLOGY PROGRAM;
(1970) IFYGL B (SPECIAL) NO 20, PP44;
PRECIPITATION; METEOROLOGY; MEASUREMENT; METHODS; IFYGL; PROGRAMS; RESEARCH; RADAR; REMOTE SENSING;
IFY-B20; GCODE5;
PRECIPITATION MEASUREMENTS FOR LAKE ONTARIO AND ITS WATERSHED WERE DERIVED FOR THE 1-YR PERIOD FROM APRIL 1972 TO MARCH 1973 OF THE IFYGL. 6 TECHNIQUES WERE USED IN OBTAINING THE ESTIMATES. 5 OF THE TECHNIQUES WERE BASED SOLELY ON PRECIPITATION GAGE DATA. THE 6TH COMBINED DATA FROM 2 WEATHER RADARS AND 167 PRECIPITATION STATIONS TO PRODUCE A DETAILED PRECIPITATION ANALYSIS FOR THE ENTIRE BASIN FOR EACH DAY OF THE FIELD YEAR. THE PRECIPITATION OBSERVATION SYSTEMS AND MEASUREMENT TECHNIQUES ARE DESCRIBED, AND MEASUREMENTS ARE COMPARED. ACCURACIES OF THE PRECIPITATION ESTIMATES ARE EVALUATED BASED LARGELY ON THE WITHHELD DATA FROM 3 MESONETWORKS OF RAIN GAUGES. THE AVERAGE ERROR IN THE MONTHLY PRECIPITATION AMOUNTS FOR THE WATERSHED IS LESS THAN 5% AND BETWEEN 10

AND 15% FOR OVERLAKE ESTIMATES. IN ADDITION, IT IS ESTIMATED THAT THE MEASUREMENTS FOR THE WARM SEASON AVERAGE ANOTHER 7% TOO LOW. CONFIDENCE IN THE PRECIPITATION ESTIMATES AND ACCURACY FIGURES FOR THE COLD SEASON ARE RELATIVELY LOW BECAUSE OF DIFFICULTIES IN ACCURATELY MEASURING SNOWFALL. THE LAKE HAD A DISCERNABLE EFFECT ON THE PRECIPITATION APPROXIMATELY ONE-HALF OF THE PRECIPITATION DAYS. DURING THE WARM SEASON, THIS WAS BY SUPPRESSING SHOWER ACTIVITY OVER THE LAKE AND DURING THE COLD SEASON BY INITIATING SHOWER ACTIVITY OVER AND DOWNWIND OF THE LAKE. THE DAYS ON WHICH THE LAKE HAD THE GREATEST IMPACT ON PRECIPITATION PATTERNS WERE CHARACTERIZED BY SCATTERED, LIGHT SHOWERS. THUS, WHILE THE LAKE FREQUENTLY INFLUENCES PRECIPITATION PATTERNS, ITS EFFECT ON TOTAL SEASON PRECIPITATION IS LESS APPARENT.;

654 WILSON, JOHN E.;
PROTECTING A NATURAL BEACH;
(1970) THE CONSERVATIONIST. PP26-32;
BEACHES; REGULATION; RECREATION;
1623; GCODES05;

655 WITTEN, ALAN J.; THOMAS, JOHN H.;
CALCULATION OF STEADY CURRENTS IN LAKE ONTARIO WITH VARIABLE EDDY VISCOSITY;
(1976) J GREAT LAKES RES 2(2):357-363;
CURRENTS; EDDY DIFFUSIVITY; WIND; VISCOSITY; MODEL STUDIES; MATHEMATICAL MODELS;
GCODE5;
A THEORY OF STEADY WIND-INDUCED CURRENTS WITH DEPTH DEPENDENT EDDY VISCOSITY IS APPLIED TO LAKE ONTARIO WITH ACCURATE TOPOGRAPHIC REPRESENTATION. RESULTS ARE PRESENTED FOR A UNIFORM WIND FROM THE WEST, AND THESE ARE COMPARED WITH PREVIOUS RESULTS FOR A CONSTANT EDDY VISCOSITY AS WELL AS CURRENT MEASUREMENTS MADE IN LAKE ONTARIO DURING IFYGL. THIS STUDY SHOWS THAT, WHILE THE VERTICALLY INTEGRATED MASS FLUX IS INSENSITIVE TO VARIATIONS IN THE EDDY VISCOSITY, THE 3-DIMENSIONAL CURRENTS ARE SENSITIVE TO THESE VARIATIONS. ALTHOUGH THE IRREGULAR BOTTOM TOPOGRAPHY OF LAKE ONTARIO STRONGLY INFLUENCES THE CURRENT PATTERN, THE NATURE OF THE COASTAL JETS, RETURN FLOW, AND UPWELLING AND DOWNWELLING ARE CHARACTERISTICS OF THE EXPONENTIAL EDDY VISCOSITY;

656 WOLF, JAMES M;
LAND MANAGEMENT IN THE LAKE ONTARIO BASIN;
(1973) NY STATE SEA GRANT PROGRAM, GREAT LAKES MANAGEMENT PROBLEMS SERIES, 39P;
LAND USE; DEVELOPMENT PLANNING; HYDROLOGY;
US-CS-NY-C6; GCODE5;

657 WOLFERT, DAVID R.; MILLER, TERENCE J.;
AGE, GROWTH, AND FOOD OF NORTHERN PIKE IN EASTERN LAKE ONTARIO;
(1978) TRANS AM FISHERIES SOC 107(5):696-702;
AGE; GROWTH; FOOD; ESOX LUCIUS; PREDATION;
7857; GCODES04; GCODES05;
NORTHERN PIKE (ESOX LUCIUS) FROM EASTERN LAKE ONTARIO WERE SAMPLED WITH GILL NETS AND TRAP NETS IN 1972-1973. FISH OF AGE-GROUPS IV, V, AND VI WERE PREDOMINANT IN THE CATCH. ALTHOUGH MALES WERE SLIGHTLY LONGER AFTER THE 1ST YEAR OF LIFE, FEMALES GAINED A 25-MM ADVANTAGE IN THE 2ND YR AND A 30-MM ADVANTAGE IN THE 3RD YR. IN LATER YEARS, THE INCREMENTS OF GROWTH OF MALES AND FEMALES WERE SIMILAR. ALL MALES WERE MATURE AFTER 2 YR AND FEMALES AFTER 3 YR. THE STOMACHS OF NORTHERN PIKE CONTAINED ONLY FISH; THE ALEWIFE WAS THE PRINCIPAL FORAGE SPECIES CONSUMED. ELECTIVITY INDEXES FOR ALEWIVES, WHITE PERCH, AND YELLOW PERCH, THE THREE MOST COMMON SPECIES IN THE DIET, INDICATED A POSITIVE SELECTION FOR ALEWIVES THAT INCREASED FROM JUNE TO OCT DURING A PERIOD WHEN THE RELATIVE ABUNDANCE OF ALEWIVES STEADILY DECREASED.;

658 WONG, PAUL T. S.; CHAU, YIU K.; LUXON, P. LYNNE;
METHYLATION OF LEAD IN THE ENVIRONMENT;
(1975) NATURE, 253(5489):263-264;
LEAD; HEAVY METALS; SEDIMENT;
CAN-CCIW-CP-7; GCODE5;

659 WOODRUFF, DONALD L.; LEWIS, THOMAS L.; SUTTON, ROBERT G.;

LAKE ONTARIO AS A SOURCE OF SAND;
(1971) ROCK PRODUCTS, PP2;
MINERALOGY; SHORE; COASTAL ZONE; BOTTOM;
7896; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5; GCODE5D3; GCODE5D5;
GCODE5D4;

660 YOKUM, THOMAS G.; TAIT, HOWARD D.;
ENERGY-RELATED RESEARCH OF THE U.S. FISH AND WILDLIFE SERVICE ON THE GREAT LAKES;
(1976) PROCEEDINGS OF THE SECOND FEDERAL CONFERENCE ON THE GREAT LAKES, PP. 513-516;
RESEARCH; ENERGY;
GCODE1; GCODE2; GCODE3; GCODE4; GCODE5; 4718; GCODE6;

661 YU, SHAW L.; BRUTSAERT, WILFRIED;
STOCHASTIC ASPECTS OF LAKE ONTARIO EVAPORATION;
(1969) WATER RESOURCES RESEARCH. VOL. 5. NO. 6. PP1256-1266;
EVAPORATION; TEMPERATURE; MODEL STUDIES; SPECTRAL ANALYSIS; WIND;
2396; GCODE5;
TIME SERIES ANALYSIS WAS CARRIED OUT ON LONG-TERM MONTHLY MEAN VALUES OF EVAPORATION FROM LAKE ONTARIO, WHICH WERE GENERATED IN AN EARLIER STUDY, AND ON RELATED METEOROLOGIC PARAMETERS. CORRELATION AND SPECTRAL ANALYSES SHOWED THAT THE ANNUAL CYCLE WAS DOMINANT IN ALL THE TIME SERIES. EVAPORATION IS USUALLY HIGH IN AUTUMN AND WINTER AND LOW IN SPRING AND SUMMER. A WARMING TREND WAS OBSERVED IN THE AIR TEMPERATURE AND A DRYING TREND IN THE RELATIVE HUMIDITY SERIES. EXCEPT FOR THE WIND SPEED, NO SIGNIFICANT TREND WAS FOUND FOR THE OTHER TIME SERIES. CROSS CORRELATION AND CROSS-SPECTRAL ANALYSES SHOWED A CLOSE RELATIONSHIP BETWEEN EVAPORATION ANOMALIES AND THE ANOMALIES OF THE OTHER PARAMETERS. A FIRST ORDER MARKOV MODEL ADEQUATELY DESCRIBED THE EVAPORATION, AIR TEMPERATURE, AND RELATIVE HUMIDITY ANOMALIES, WHEREAS A SECOND ORDER MODEL FITTED THE ANOMALIES OF WIND SPEED AND WATER SURFACE TEMPERATURE. MORTON'S (1967) WATER BUDGET METHOD YIELDS HIGHER EVAPORATION ESTIMATES IN THE SUMMER AND LOWER ESTIMATES IN THE WINTER THAN THE MASS TRANSFER ESTIMATES;

662 ZANDER, RICHARD H.;
FLORISTICS AND ENVIRONMENTAL PLANNING IN WESTERN NEW YORK AND ADJACENT ONTARIO: DISTRIBUTION OF LEGALLY PROTECTED PLANTS AND PLANT SANCTUARIES;
(1976) BUFFALO SOCIETY OF NATURAL SCIENCES OCCASIONAL PAPERS NO. 1, 47P;
PLANTS; ENDANGERED SPECIES; DISTRIBUTION; WETLANDS; MAPPING;
BUF-BSNS-OP-1; GCODE4G2; GCODE4G4; GCODE4G3; GCODE4G5; GCODE5A4; GCODE5B2;
GCODE5B4;
A DOT MAP SURVEY COMPARES THE GEOGRAPHIC DISTRIBUTION OF LIMITED-ACCESS SANCTUARIES WITH KNOWN STATIONS OF PLANT SPECIES OF THE NIAGARA FRONTIER RECOGNIZED AS THREATENED BY NEW YORK STATE LAW. WETLAND SPECIES ARE WELL REPRESENTED IN SANCTUARIES, BUT CALCIPHILIC SPECIES ARE NOT. MINOR POLITICAL DISTRICTS ARE RANKED BY RICHNESS IN NUMBERS OF SPECIES, ESPECIALLY THOSE OF RESTRICTED HABITAT. BOTANICALLY SIGNIFICANT AREAS ARE LISTED;

663 ZAR, HOWARD;
ENVIRONMENTAL VALUE APPROACH TO ENFORCEMENT;
(1976) ROSENBERGER, DAVID R. AND ANDREW ROBERTSON, EDITORS, WORKSHOP ON ENVIRONMENTAL MAPPING OF THE GREAT LAKES, IJC, P51-53;
MAPPING; REGULATION; WATER QUALITY;
IJC-RA7; GCODE6;

664 ZENGER, DONALD H.;
THE LOCKPORT FORMATION IN WESTERN NEW YORK;
(1966) GEOLOGY OF WESTERN NEW YORK GUIDEBOOK, NY STATE GEOLOGICAL ASSOC 38TH ANNUAL MEETING, PP19-23;
GEOLOGY; MINERALOGY; PALEONTOLOGY; NY;
NYG-38; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2; GCODE5C5;

665 ZENKERT, CHARLES A.;
THE FLORA OF THE NIAGARA FRONTIER REGION;

(1934) BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN VOL 16, 328P;
PLANTS; GEOLOGY; COASTAL ZONE; CLIMATIC FACTORS; HABITAT; DISTRIBUTION;
ABUNDANCE;
BUF-BSNS-BULL16; GCODE4G; GCODE5A2; GCODE5A4; GCODE5B2; GCODE5B4; GCODE5C2;

688 ZENKERT, CHARLES A.; ZANDER, RICHARD H.;
FLORA OF THE NIAGARA FRONTIER REGION, SUPPLEMENT;
(1975) BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN VOL 16, 62P;
PLANTS; DISTRIBUTION; HABITAT; ABUNDANCE;
BUF-BSNS-BULL16S; GCODE464; GCODE463; GCODE465; GCODE5A4; GCODE5B2; GCODE5B4;

END OF PROGRAM RUN

Appendix A

LIST OF AGENCIES CONTACTED

BLACK RIVER - ST. LAWRENCE REGIONAL PLANNING BOARD
R & D Center
St. Lawrence University
Canton, New York 13617

BUFFALO & ERIE COUNTY HISTORICAL SOCIETY
Dr. Herman Sass, Librarian
25 Nottingham Court
Buffalo, New York 14222
716-873-9644

BUFFALO MUSEUM OF SCIENCE
Dr. Robert F. Andrle, Director
Humboldt Parkway
Buffalo, New York 14211
716-896-5200

CANADA CENTRE FOR INLAND WATERS
Emma Fosdick, Head, Library Services
P. O. Box 5050
Burlington, Ontario L7R4A6

THE CANAL MUSEUM
Todd S. Weseloh, Librarian
Weighlock Building
Erie Boulevard East
Syracuse, New York 13202
GR1-0593

CAYUGA COUNTY MUSEUM
Tom Eldred, County Historian
Auburn, New York 13021

CAYUGA COUNTY PLANNING BOARD
County Office Building
160 Genesee Street
Auburn, New York 13021

CORNELL UNIVERSITY
Water Resources Center
Ernest Hardy
Resource Information Laboratory
Box 22
Roberts Hall
Ithaca, New York 14853

ERIE - NIAGARA COUNTIES REGIONAL PLANNING BOARD
Niagara County
3101 Sheridan Drive
Eggertsville, New York 14226
716-625-8114

FEDERATION OF NEW YORK STATE BIRD CLUBS INC.
Lee B. Chamberlaine
Box 139
Henderson, New York 13650

FEDERATION OF NEW YORK STATE BIRD CLUBS INC.
Edward Fessler
Buffalo Ornithological Society
Buffalo Museum of Science
Humboldt Parkway
Buffalo, New York 14211

FEDERATION OF NEW YORK STATE BIRD CLUBS INC.
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Amity Lake
Belmont, New York 14813

FEDERATION OF NEW YORK STATE BIRD CLUBS INC.
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North Syracuse, New York 13212

FEDERATION OF NEW YORK STATE BIRD CLUBS INC.
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Webster, New York 14580

DR. HERMAN FOREST
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Bailey Science Building
SUC Geneseo
Geneseo, New York 14454

GENESEE/FINGER LAKES PLANNING BOARD
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Rochester, New York 14614

GENESEE STATE PARK AND RECREATION COMMISSION
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Great Lakes Basin Commission
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Ann Arbor, Michigan 48106
313-668-2300

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Chaumont, New York 13622

JEFFERSON COUNTY HISTORICAL SOCIETY
Paddock Mansion
Washington Street
Watertown, New York 13601

LANDMARKS ASSOCIATION OF WESTERN NEW YORK
Cindy Howe
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Rochester, New York 14608

LEAGUE OF WOMEN VOTERS
Erie Chapter
1976 Sheridan Drive
Apartment 2
Buffalo, New York 14223

LEAGUE OF WOMEN VOTERS
New York State
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Guilderland, New York 12084

MONROE COUNTY HISTORIAN
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Rochester, New York 14604

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Lawrence P. Brown
Significant Habitat Unit
Wildlife Resource Center
Delmar, New York 12054 518-457-4857

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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Wetlands Inventory Unit
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Albany, New York 12201 518-457-3431

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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Environmental Analysis and Permits
Region 9
584 Delaware Avenue
Buffalo, New York 14202
716-842-5041

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Charles A. McNulty, Chief of Community Assistance
50 Wolf Road
Albany, New York 12233

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Mr. William Pearce
Great Lakes Fisheries Section
P.O. Box 292
Cape Vincent, New York 13618

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Eric Seiffer
Division of Fish and Wildlife
P.O. Box 57
Avon, New York 14414 716-226-2466

NEW YORK STATE DEPARTMENT OF HEALTH
Dagmar Michalova, Library Director
Division of Laboratories and Research
Tower Building
Empire State Plaza
Albany, New York 12201

NEW YORK STATE DIVISION FOR HISTORIC PRESERVATION
New York State Parks and Recreation
Kathleen La Frank, Archivist
Agency Building
Empire State Plaza
Albany, New York 12238

NEW YORK STATE EDUCATION DEPARTMENT
P. Lord
New York State Museum and Science Service
Albany, New York 12234

NEW YORK STATE ELECTRIC AND GAS CORPORATION
M. J. Ray, Manager - Nuclear Projects
Binghamton, New York 13902

NEW YORK STATE HISTORICAL ASSOCIATION
Marion Brophy, Special Collections Librarian
Cooperstown, New York 13326 607-547-2533

NEW YORK STATE SEA GRANT EXTENSION PROGRAM
David Green
Farm and Home Center
21 S. Grove Street
East Aurora, New York 14052

NEW YORK STATE SEA GRANT INSTITUTE
Louise Frank, Publications Controller
State University of New York
99 Washington Avenue
Albany, New York 12246

NIAGARA COUNTY HISTORICAL SOCIETY
215 Niagara Street
Lockport, New York 14094

ONTARIO WATER RESOURCES COMMISSION
135 St. Clair Avenue West
Suite 100
Toronto, Ontario M4V 1P5

OSWEGO HERITAGE FOUNDATION
Judy Nichols, Executive Director
161 West 1st Street
Oswego, New York 13126

ROCHESTER CITY HISTORIAN
Joseph W. Barnes
Public Library
115 South Avenue
Rochester, New York 14604

ROCHESTER GAS & ELECTRIC CORPORATION
Margaret Fenlon, Document Preparation
89 East Avenue
Rochester, New York 14649

ROCHESTER PUBLIC LIBRARY
Wayne K. Arnold, Head Librarian Local History Division
115 South Avenue
Rochester, New York 14604

ST. LAWRENCE - EASTERN ONTARIO COMMISSION
Daniel J. Palm, Prin. Coastal Zone Resources Specialist
Peter C. Strakulski, Public Information Officer
317 Washington Street
Watertown, New York 13601
315-782-0100 Ext. 263-4

ST. LAWRENCE SEAWAY DEVELOPMENT CORPORATION
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Massena, New York 13662

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State University of New York
99 Washington Avenue
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SUNY COLLEGE AT OSWEGO
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Penfield Library
Oswego, New York 13126

U. S. ARMY CORPS OF ENGINEERS
Buffalo District
1776 Niagara Street
Buffalo, New York 14207
716-876-5454

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Rochester, New York 14614

UNITED STATES EPA
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Great Lakes National Program
EPA Region V
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UNITED STATES FISH & WILDLIFE SERVICE
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UNITED STATES GEOLOGICAL SURVEY
District Chief, Water Resources Division
U. S. Post Office and Courthouse
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Albany, New York 12201

THE UNIVERSITY OF ROCHESTER LIBRARY
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Department of Rare Books, Manuscripts and Archives
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